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AUTHOR Richardson, Richard C., Jr.; Doucette, Donald S.
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ABSTRACT

A study was conducted to compare the academic persistence, performance, and degree attainment of three groups of students who were enrolled in a baccalaureate degree program at Arizona State University, the University of Arizona or Northern Arizona University between 1976 and 1980. The study groups were defined in terms of the students' postsecondary educational backgrounds. One group had, in 1976, already completed 24 to 36 credit hours at the same university. The second group had transferred to a state university in Fall 1976 after completing the equivalent of one year at a community college. The third group had transferred in Fall 1977 after completing the equivalent of two years at a community college. Student records maintained at the universities were examined to provide a demographic profile of each group and to facilitate a semester-by-semester comparison of the grade point averages, retention rates, college credits earned, and graduation rates for each group during their enrollment at the universities. Data were analyzed by high school class rank, university departmental enrollment, and, where applicable, by community college attended. The study report details methodology and limitations; profiles the groups by sex, age, and ethnicity; presents findings for each university; and recommends ways of avoiding the problems encountered in conducting the study. A literature review is appended. (JP)

Persistence, Performance and Degree Achievement of Arizona Community College Transfers in Arizona's Public Universities

November 1, 1980

Richard C. Richardson, Jr.
Donald S. Doucette

Department of Higher and Adult Education
College of Education
Arizona State University

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Introduction

The study described in this report involved the cooperation of many different groups and individuals. Contributors to the study included the following:

- Kenneth Brown and Carla Carlson of the Center for the Study of Higher Education, University of Arizona, conducted the study at that institution.
- Milton Schroeder, Dean of Admissions and Records, supervised the study at Northern Arizona University.
- The Higher Education Coordinating Committee reviewed the study design and supported its implementation.
- The Arizona Board of Regents, State Community College Board and A.S.U. College of Education provided financial assistance.
- The Registrars and Admissions officers at the three universities and the community colleges provided assistance in collecting data.
- The Universities provided direct support for the study through offices of institutional studies and planning and through computer centers.

The report which follows is a description of the results of three studies, coordinated in terms of design and methodology but differing in important respects because of differences in the data available and the computing capabilities of the three universities. The first section of the report provides an executive summary or overview of the results. The next five sections report study data in some detail. The concluding chapter contains recommendations for future studies.

LIST OF TABLES

1. Overview of the Study

This report has been organized into seven sections. The first section provides an overview of the study and its findings. Sections 2-6 provide detailed information on procedures used in selecting the study groups, the composition of the groups and the results of data analysis. Section 7 reports recommendations that should be considered by the universities and community colleges to make it possible to carry out future studies without experiencing some of the problems that characterized this effort.

Purpose of the Study

The study was designed to answer questions about the persistence, performance, progress, and degree achievement of students who transfer from one of Arizona's community colleges to one of its State universities. The specific research questions were:

- Persistence - Do community college transfer students continue in attendance at rates comparable to university native students?
- Performance - Do community college transfer students attain cumulative grade point averages at State universities comparable to the cumulative grade point averages they attained at community colleges and comparable to the cumulative grade point averages earned by university native students?
- Progress - Do community college transfer students earn credit hours toward graduation at rates comparable to university native students?
- Degree Achievement - Do community college transfer students graduate at rates comparable to university native students?

Research Design

While the details of the design are reported in the section on methodology, several characteristics of this study need to be understood in order to interpret the results.

- Retrospective Nature - This study used data stored on computer files at the three universities to reconstruct a hypothetical high school graduating class of 1975. Students entered the study in 1976 if they were in attendance at one of the State universities that fall after previously completing a minimum of 24 credit hours either at the same university or at an Arizona community college. Students also entered the study in the fall of 1977 if they were in

attendance at a State university the fall after completing a minimum of 48 credit hours at an Arizona community college. Thus the study sought to reconstruct the academic careers of three sub-populations from the high school class of 1975: those who entered a State university the fall after graduation and earned at least 24 credit hours by the fall of 1976, those who entered a community college the fall after graduation and then transferred to a State university one year later after completing at least 24 credit hours, and those who entered a community college the fall after graduation and then transferred to a State university two years later after completing at least 48 credit hours. The limitations and qualifications of this design characteristic are explained in greater detail in Section 2.

- Multiple Studies - In effect this report describes three studies rather than a single study. While standard definitions and similar methodologies were used by each university, the characteristics of the information systems available resulted in adaptations as the design was executed. The studies at Arizona State and the University of Arizona involved all students who met design criteria. The results of these two studies can be compared with a reasonably high level of confidence. The information system at Northern Arizona University for the years of interest to the study did not permit the use of either random sampling techniques or the study of the entire population. Because of the small numbers in the NAU sample and the procedures that had to be used in its selection, care is required in interpreting results or comparing results with the other two universities.

- Population Studied - Available research indicates students who attend community colleges have different characteristics than those who enter universities directly after high school. Since these differing characteristics have been shown to affect academic performance, it was necessary to develop a method of controlling for the most important differences. A failure to control for the difference of full-time versus part-time attendance, for example, would have produced a study of the impact of working full-time while attending college part-time rather than a study of the impact of attendance at a community college. The method chosen to control for the more important sources of variation was to select only students who were attending full-time and who appeared to be making normal progress toward a degree at the time they entered the study. The results of the study can, therefore, be safely generalized only to those who meet these criteria. A study of part-time students who transferred less than 24 credit hours to a university from a community college might produce quite different findings.

- Methods of Comparison - In selecting a format for depicting comparisons we chose to compare students entering the study in 1977 after completing the equivalent of two years at a community college with students entering the study in 1976 after completing the equivalent of one year at a community college or university. This method of comparison tends to enhance persistence rates for those entering the study in 1977 since they have one year less in which to drop out. The University of Arizona, which has the most developed information system of the three universities, did additional work on comparing groups. Their findings are reported in Appendix A.

Characteristics of the Study Populations

Three groups of students were studied at each university. These groups were:

- Natives - Students entering the university directly after high school.
- CC1 - Students transferring to the university after completing the equivalent of one academic year in a community college.
- CC2 - Students transferring to the university after completing the equivalent of two academic years in a community college.

The characteristics of these three groups are reported in Tables 1.1.a and 1.1.b.

Findings

Persistence

Findings having to do with persistence are summarized in Table 1.2.

- At Arizona State University and the University of Arizona native students showed the highest rate of persistence followed closely by students who had completed two years at a community college before transferring. At both universities, but particularly at Arizona State, students who transferred after completing the equivalent of one year of study at a community college persisted at significantly lower rates than did the other two groups.
- At Northern Arizona University the findings appear to be exactly reversed with native students persisting least well followed by transfers with two years at a community college

Table 1.1.a

CHARACTERISTICS OF STUDY GROUPS BY UNIVERSITY

	ASU			U of A			NAU		
	Nat	CC1	CC2	Nat	CC1	CC2	Nat	CC1	CC2
Number at Entry	1542	154	1041	2105	130	183	104	29	22
Sex:									
% Male	49.2	58.4	54.4	50.5	60.8	59.6	51.9	44.8	59.1
% Female	50.8	41.6	45.6	49.5	39.2	40.4	48.1	55.2	40.9
Average Age:	19.5	21.2	24.4	19.6	20.3	22.1	20.5	21.2	22.9
Ethnic Group:									
% Nat. American	.8	2.6	1.0	.5	.0	.0	Not		
% Oriental	1.4	1.3	1.1	1.1	.0	.0	Available		
% Hispanic	4.7	9.7	9.0	4.9	7.7	13.1	"		
% Black	2.7	2.3	2.5	1.1	1.5	.6	"		
% Other	90.3	83.8	86.5	40.6	90.8	86.3	"		
% Not Reported	.0	.0	.0	51.9	.0	.0	"		

Table 1.1.b

ARIZONA COMMUNITY COLLEGES OF TRANSFER BY UNIVERSITY

	ASU				U of A				NAU			
	CC1		CC2		CC1		CC2		CC1		CC2	
	No.#	%	No.#	%	No.#	%	No.#	%	No.#	%	No.#	%
Arizona Western	2	1.3	27	2.6	9	6.9	13	7.1	Not Available			
Central Arizona	4	2.6	23	2.2	11	8.5	10	5.5	"			
Cochise	3	1.9	7	.7	9	6.9	20	10.9	"			
Eastern Arizona	2	1.3	11	1.1	3	2.3	9	4.9	"			
Glendale	23	14.9	259	24.9	15	11.5	17	9.3	"			
Maricopa Tech.	2	1.3	25	2.4	0	.0	1	.6	"			
Mesa	40	26.0	302	29.0	9	6.9	7	3.8	"			
Mohave	0	.0	0	.0	2	1.5	0	.0	"			
Northland Pioneer	0	.0	3	.3	0	.0	0	.0	"			
Phoenix	50	32.5	233	22.4	14	10.8	17	9.3	"			
Pima	1	.6	9	.9	46	35.4	82	44.8	"			
Scottsdale	24	15.6	127	12.2	9	6.9	6	3.3	"			
Yavapai	2	1.3	15	1.4	3	2.3	1	.6	"			
Arizona Coll Tech	1	.6	0	.0	0	.0	0	.0	"			

Table 1.2

PERSISTENCE OF AGGREGATE STUDY GROUPS

Percent of Original Group Persisting
(Continuers or Graduates)

	ASU			U of A			NAU		
	Nat	CC1	CC2	Nat	CC1	CC2	Nat	CC1	CC2
Fall 76	100.0	100.0		100.0	100.0		100.0	100.0	
Spring 77	93.3	80.3		99.9	99.2		83.2	88.9	
Fall 77	81.1	61.2	100.0	77.6	73.8	100.0	80.2	85.2	100.0
Spring 78	77.3	55.8	85.8	73.1	67.7	89.6	83.2	85.2	89.5
Fall 78	73.8	45.6	72.1	68.5	62.3	72.5	65.3	59.3	47.4
Spring 79	71.8	46.3	67.1	65.7	60.0	70.3	44.6	63.0	42.1
Fall 79	63.9	40.1	59.4	62.5	53.1	61.0	42.6	77.8	31.6
Spring 80	63.0	36.1	58.6	63.8	54.6	62.1	41.6	66.7	52.6

and those with one year in that order. However, the small number in the sample at NAU combined with the way in which the sample was identified makes this finding questionable. The nearly 67 percent persistence rate for the twenty-seven students in the CC1 group at NAU exceeded persistence rates for all other groups in all three universities in the study and suggests a systematic bias in the process used to identify the group. Similar biases may also help to account for the low rate of persistence reported for native students at NAU.

Performance

Findings related to performance are summarized in Table 1.3.

- At Arizona State University students with two years at a community college entered with cumulative grade point averages slightly above B, declined less than a half of a grade point average during the first semester at the university, rebounded immediately and by the next semester were earning grade point averages slightly below B, or about the same as native students at the same points in their university careers. Students with one year at a community college entered with lower cumulative grade point averages in the B- to B range. They experienced about a half a grade point average drop in their cumulative grade point averages during the first semester, but those who remained were earning B- averages five semesters after entry.

- At the University of Arizona a significant transfer shock seemed to occur. Both groups of transfer students entered with much higher cumulative grade point averages than the ones earned by native students or for that matter by any other groups at any universities in the study. During the first semester after entry cumulative grade point averages dropped nearly a full grade point from B+ to C+ for the CC1 group and less for the CC2 group. Thereafter the transfers improved their averages until at the end of the study both were in the B- range approximately one fourth of a grade point average below the native group. As at Arizona State, comparisons involving groupings by rank in high school graduating class reduced the observed differences indicating the importance of considering this variable in studies of this type.

- At Northern Arizona University the results appeared generally comparable to the other two universities within the limits of variability for small samples. Both transfer groups demonstrated a modest decline followed by recovery. At NAU the CC2 group actually outperformed the native students, unlike the other two universities.

Table 1.3

PERFORMANCE OF AGGREGATE STUDY GROUPS

Average Cumulative Grade Point
Average of Continuers

	ASU			U of A			NAU		
	Nat	CC1	CC2	Nat	CC1	CC2	Nat	CC1	CC2
Entry Grade Point Average	2.79	2.86	3.09	2.69	3.23	3.15	2.35	2.69	3.05
1st Semester	2.77	2.28	2.62	2.77	2.38	2.50	2.49	2.22	2.76
2nd Semester	2.89	2.52	2.82	2.84	2.50	2.61	2.59	2.37	2.79
3rd Semester	2.93	2.61	2.82	2.84	2.56	2.63	2.63	2.49	2.81
4th Semester	2.97	2.74		2.87	2.63		2.64	2.53	
5th Semester	2.97	2.74		2.86	2.62		2.67	2.61	

Progress

Findings related to progress are summarized in Table 1.4.

- At all three universities native students and transfers with two years at a community college progressed toward a degree at a faster rate than did transfers with one year at a community college.

- At Arizona State and the University of Arizona transfers with one year at a community college began with approximately the same number of credit hours as native students but fell further behind during each succeeding semester. Transfers with two years in a community college progressed at rates nerly identical to native university students.

- The observed rates of progress of all groups indicate that the continuers averaged full-time loads during each semester. Thus the study appears to have controlled for the variable of part-time vs. full-time study increasing confidence in the comparability of the groups selected.

Degree Achievement

Findings related to degree achievement are summarized in Table 1.5.

- At Arizona State University and the University of Arizona similar percentages of native students and transfers with two years at a community college had accumulated enough hours to graduate by the fall of 1979, or four and a half years after hypothesized high school graduation. As would be expected from the data on persistence and progress a much smaller percentage of students with one year at a community college had achieved similar status.

- The data from Northern Arizona suggest more than anything else the need for further study based on a more adequate sample.

Conclusion

How well do community college students perform after transferring to a university? The answer to this question depends upon some frame of reference. The frame of reference used in this study was the performance of the native student. The comparison of native students with transfer students has to be done with some care since the former possess characteristics that give them an advantage in competing for grades. Native students are eligible to attend a university upon graduation from high school, which implies superior performance on the average in tests of

Table 1.4

PROGRESS OF AGGREGATE STUDY GROUPS

Average Cumulative Credit Hours Earned

	ASU			U of A			NAU		
	Nat	CC1	CC2	Nat	CC1	CC2	Nat	CC1	CC2
Hours at Entry	29.5	29.8	60.8	29.8	28.7	57.6	29.1	28.8	59.4
1st Semester	13.9	16.6	14.5	13.3	10.9	13.0	12.0	13.8	15.2
2nd Semester	28.0	29.9	28.2	28.2	24.4	28.8	24.7	28.7	30.0
3rd Semester	40.1	36.7	38.5	41.1	36.3	40.8	39.4	40.2	45.8
4th Semester	54.3	49.4		56.8	49.0		54.6	53.2	
5th Semester	68.8	58.5		69.9	63.0		69.7	67.0	
Totals	98.3	88.3	99.3	99.7	91.7	98.4	98.8	95.8	105.2

Table 1.5

DEGREE ACHIEVEMENT OF AGGREGATE STUDY GROUPS

Percent of Original Group Graduated

	ASU			U of A			NAU		
	Nat	CC1	CC2	Nat	CC1	CC2	Nat	CC1	CC2
Spring 78	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fall 78	3.0	2.7	4.9	4.7	1.5	2.8	4.0	11.1	0.0
Spring 78	31.4	10.2	25.9	32.6	13.1	28.0	6.9	37.0	10.5
Fall 79	46.9	17.0	40.7	43.9	30.8	41.8	14.9	48.1	26.3

academic aptitude and in high school academic work. This is not to say that superior students always attend universities in preference to community colleges. It is to say that community colleges include in their freshman classes many students who were not admissable to a university. Ultimately, many of these students transfer to universities after completing successfully one or two years of work at the community college.

It is reasonable to expect community colleges to provide comparable work to that offered in the first two years of a university. It is less reasonable to expect them to convert students who have to work hard to earn C's into students who will be good candidates for Summa Cum Laude. Community colleges, by virtue of their mission, work with a less select group of students than do the universities. It would be reasonable to expect that in any head-to-head comparison based upon grades, the university native student should outperform the community college transfer students.

It is not surprising, therefore, that this is exactly what this study found. What is surprising is how well the transfer student with two years at a community college does perform in relation to the native student. When such differences as rank in high school graduating classes are controlled, the differences disappear for practical purposes. Even when this difference is not controlled the transfer student does well in comparison with the native student. When 41 to 42 percent of transfers with two years at a community college graduate during the period of the study in comparison with 47 - 44 percent of native students at ASU and U of A, the fact that the latter graduate with slightly higher averages than the averages of the former does not seem reason for much concern since both were in the low B range.

That is not to say this study is lacking in implications for legislators and university and college staffs. Some of the implications that should be considered are the following:

1. Students who transfer from community colleges after the equivalent of one year appear to be at a significant disadvantage in comparison with native students and those who complete two years of community college work. It seems likely that the disadvantage might be even more pronounced among community college transfers ineligible to attend a university upon high school graduation who transfer after completing less than 24 credit hours at a community college, the minimum required for inclusion in this study. The performance of this group needs further study by each university to determine implications for admission practices.

2. Community colleges whose transfer students earn high cumulative grade point averages and experience significant transfer shock upon moving to a university should examine grading practices to determine if the standards they employ in awarding grades give students an appropriate

understanding of the demands of their classes at the transfer institution. (Note: This seemed to be a possible problem for only a few community colleges in Arizona. More information is available in the detailed description of the findings.)

3. Some data important to this type of study are not maintained routinely at universities or some community colleges. The choice was to try to obtain it at considerable cost during the study or to make compromises in the study design reducing the usefulness and credibility of the findings. Both of these alternatives had to be employed in completing this study. At the same time, the process of completing the study resulted in the sharing of techniques and computer programs among the three universities that would not otherwise have occurred. The final section of this report includes recommendations to improve the capability of the Arizona universities to carry out this type of study in the future.

4. As previously noted, this is a retrospective study and as such incorporates a number of limitations. We do not, for example, know anything about those who did not persist or those who did not transfer. Retrospective studies need to be augmented by follow-up studies that begin when students are still in the community colleges and follow them to universities to determine why they leave as well as why they stay. Community colleges need to work with the universities to develop procedures for routinely following transfers and reporting their progress. Ideally, the format for such feedback would be standardized across universities and would stratify transfers according to such important variables as full-time versus part-time, number of hours earned at the community college and other important descriptors.

5. One of the facts of life that this study demonstrates convincingly is the growing tendency for students to study part-time. At none of the universities did the number of native students selected as attending full time and making normal progress in the Fall of 1976 represent as much as ten percent of the reported enrollment for that university in that year. At Arizona State the number was less than five percent. The growing importance of students who do not conform to traditional expectations about their level of commitment or rate of progress suggests a need to learn more about this new majority.

6. The focus of this study was the community college transfer. Therefore, the analysis did not pursue some of the implications of the disaggregated data. The capability exists, however, to study other university entry groups besides

transfer community college students and to compare their persistence, performance, progress and degree achievement within the various university colleges. The results of such studies might furnish useful information to those concerned with recommending or approving university policies.

7. A comparison of the results of this study with the results reported for similar studies in such states as Illinois, Pennsylvania, Florida and Missouri indicates that Arizona community college transfers do as well as or better than the transfer students in these states. (Appendix B provides a comprehensive review of national and state transfer studies conducted during the past fifteen years.

2. Design of the Study

The purpose of this study was to compare the performance of students who complete a significant part of their work toward a baccalaureate degree at an Arizona community college with the performance of students who enter a State university directly after completing their secondary school certificate. By comparing these groups it was possible to draw inferences about the extent to which college parallel programs at community colleges provide a learning experience equivalent to the one experienced by students who complete their lower division work in one of the State universities.

To accomplish the purpose of the study three research questions were asked.

(1) Do students who transfer to State universities from Arizona community colleges remain in attendance at rates comparable to students entering the universities directly from secondary school? The term persistence is used to refer to the tendency to remain in attendance. Detailed information about this question appears in Chapter 4.

(2) Do students who transfer to State universities from Arizona community colleges attain cumulative grade point averages they earned at community colleges and comparable to the cumulative grade point averages earned by students who enter the universities directly after secondary school? The term performance is used to refer to the comparative cumulative grade point averages earned by transfer students. Detailed information about this question appears in Chapter 5.

(3) Do students who transfer to State universities from Arizona community colleges earn credit hours and graduate at rates comparable to students who entered the State universities directly after secondary school? The terms, progress, and degree achievement are used to refer to the number of hours earned and the percentages of students graduating. Detailed information about this question is contained in Chapter 6.

Students who attend community colleges after high school graduation tend to differ from those who go directly into universities in a number of important ways. Community college students are more likely to attend part-time, are more often responsible for all or part of the costs of college attendance, did less well in their high school work on the average and scored lower on the average on national tests of academic aptitude such as those administered by the American College Testing

Program.* For the study to produce useful information about the persistence, performance, progress and degree achievement of community college transfers in comparison with students entering the universities directly from high school, it was necessary to be certain the groups were as comparable as the data available would permit. For example, comparing part-time community college transfers with full-time students entering directly from high school would have produced severe distortion on the questions of progress and degree achievement. The groups chosen for study represented the largest number of individuals who have traditionally been regarded as "typical undergraduate college students."

Selection of the Study Population

The decision was made to follow students who graduated from high school in the Spring of 1975 and who subsequently entered a public institution of higher education as full-time students in the Fall of that year. Because the data available on this population consisted of the student information systems at the three universities, it was necessary to construct a hypothetical population which included graduates of the high school class of 1975 who enrolled in a community college or public university in the Fall of 1975. The hypothetical population did not, however, exclude individuals who had graduated from high school prior to 1975 but who had delayed their entrance to a college or university.

Three groups of students were selected for the study according to the following criteria:

A. Native Students - Students enrolled in one of the State universities for 12 or more credit hours in the Fall of 1976 who had previously completed 24-36 credit hours at the same university.

B. Community College 1 or CC1 - Students enrolled in one of the State universities for 12 or more credit hours in the Fall of 1976 who had previously completed no more than 9 credit hours at the university in which they were enrolled and who had transferred 24-36 credit hours from an Arizona community college.

C. Community College 2 or CC2 - Students enrolled in one of the State universities for 12 or more credit hours in the Fall of 1977 who had previously completed no more than 9 credit hours at the university in which they were enrolled and who had transferred 48-64 credit hours from an Arizona Community College.

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*E. Elliot, "Academic Achievement of Transfer Students and College Comprehensive Test," Journal of College Student Personnel, 13 (1972), 266-69.

Figure 2-1 represents the hypothetical study population as it was reconstructed through the use of computer files and hard copy at the three universities.

Figure 2-1

THE STUDY POPULATION

	NATIVE	CC1	CC2
1979-80	State	State	State
1978-79	University	University	University
1977-78			
1976-77			Community College
1975-76		Community College	
	Secondary School	Secondary School	Secondary School

The decision to select these three groups was a function of the questions the study sought to answer and the desire to control as many sources of extraneous variation as possible.

The method of selecting the native and CC1 groups required a search of student record files stored on computer tape at each university for the 21st day of the fall semester of 1976. For Arizona State University and for the University of Arizona, all students who met the criteria for inclusion in Group A as previously defined were selected for the study, and all potential members of Group B were identified by their having listed an Arizona community college as the institution last attended. At Northern Arizona University the same procedure was used but only a sample of those meeting the criteria were selected for the study for reasons that will be subsequently discussed. A similar search of the fall 1977 master student record tapes for the 21st day of the semester identified potential members of Group C as previously defined by their having listed an Arizona community college as the institution last attended. Again all students meeting the criteria for this group were selected for inclusion at ASU and U of A while a sample of this group was selected at NAU.

At all three universities selection of the native group was the least complicated because the computer tapes contained all necessary data. The selection process for the two transfer groups was much more difficult and time consuming because the data on transfer credit hours in the computer files were unreliable. At Arizona State for example, the print-outs for almost a thousand potential students for inclusion in either the CC1 or CC2 group showed zero hours of transfer credit. A study of a sample of these students written academic transcripts revealed that transfer credits were often not posted on university written or computer records until one or more semesters after these students enrolled at the University.

To overcome this problem it was necessary to hand search the written records at both ASU and U of A of all students who were potential candidates for either the CC1 or CC2 group. With the cooperation and assistance of registrars at both universities, a list of all students enrolled for the fall semesters of 1976 and 1977 who listed an Arizona community college as the institution last attended was constructed. A manual search of registrars files was then conducted to record the number of credit hours transferred and the cumulative grade point average for each student at the point of transfer. This was the single most time-consuming step in the selection process. As such it represents one important area for change if future replications of this study are to be feasible.

The selection process at Northern Arizona varied from those used at ASU and U of A because of an even heavier reliance on manual recording of student data. The storage capacity and retrieval system available at NAU in fall 1976 and 1977 did not permit the inclusion of all students who met the criteria for one of the three groups. The use of programs similar to those used at ASU and U of A produced only a small sample for each group. The records of those identified were examined manually to determine if they met selection criteria and were reasonably representative of the total population of students that might be expected to meet stated criteria for inclusion in the three groups at NAU. The limited samples produced by the computer were judged to be representative of the larger population of potential selectees and their records were then retrieved and examined manually to produce the necessary data. The sampling process used to produce the NAU data prevents the NAU study from being completely comparable with the studies at ASU and U of A where total populations were included.

Analysis of Data

After selecting the three groups of students that met stated criteria, the records of each of the students were examined for each subsequent semester through spring 1980 to determine each group's collective persistence, academic performance and progress and degree achievement. The data examined included the cumulative grade point average at the point of entry into the study and for each succeeding semester for those who continued to be enrolled, the number of credit

hours earned or transferred prior to entry into the study, and the number earned for each succeeding semester for those who continued to be enrolled. Also of interest were the numbers of students of each group who continued to be enrolled, who dropped out or who graduated during any semester included in the study. These data provided the information necessary to determine the persistence, academic performance and progress of each group.

The study also collected demographic data for the students in each group including sex, age, ethnicity, the university college of their major, the college from which they transferred, and their rank in the high school class from which they graduated. High school rank data was generally available for native students, though while it was available on computer records at Arizona State University, it was available only on hard copy records at the University of Arizona. It was not, however, always available for community college transfers. A high percentage of the hard copy records of the transfers selected into both CC1 and CC2 groups at the University of Arizona contained high school rank data, because the University requires for admission the submission of a high school transcript of each community college transfer and native student. However, Arizona State University admissions procedures do not require the submission of a high school transcript, and high school rank data was not available on either computer or hard copy records. Consequently, at Arizona State, it was necessary to retrieve manually from the major sending community colleges the high school ranks of their former students. High school rank data were retrieved manually with the assistance and cooperation of the offices of admissions and records at Glendale Community College, Mesa Community College and Scottsdale Community College. Phoenix College, also one of the principal sending institutions of students enrolled at Arizona State University, did not maintain records of former students for more than a year.

High school rank data and ethnic data were not available at Northern Arizona University. Some data on university college of major and community college of transfer were available, but the samples chosen for each of the three groups were so small that disaggregation by these variables was determined to be of no significant value.

Definitions

The following definitions were used in conducting the study at all three of the universities included in the study.

Continuers are students of the original groups who were enrolled for any number of credit hours on the 21st day of a semester. Students who had dropped out and then dropped back in after a lapse of a semester or more were considered continuers for any semester in which they were enrolled as of the 21st day.

Dropouts are students of the original groups who were not enrolled on the 21st day of a semester and who had not been determined to be graduates.

Graduates are students of the original groups who had earned 124 total credit hours or more toward a degree at the university and transfer institutions combined.

In practice, a functional equivalent of this definition defined graduates as students 1) who had earned 124 total credit hours or more, or 2) whose current credit hours enrolled on the 21st day of a semester plus total credit hours earned were greater than or equal to 124 credit hours.

The second functional definition of graduate was required by use of 21-day student record tapes. In the case of a student whose current hours during a given semester and previously earned total hours combined to equal or exceed 124 total credit hours, the student was counted as a continuer during that semester but tagged as a graduate for the following semester. Once a student was identified as a graduate by any of the above definitions, that student remained among the cumulative graduates for the remaining semesters of the study.

Entry Grade Point Averages are average grade point averages earned in institutions of higher education by all students in a group prior to entry into the study, that is, prior to Fall, 1976 for all native and CC1 groups and prior to Fall, 1977 for all CC2 groups.

Average entry grade point averages for all native groups were calculated on previous work completed at the universities in which they were enrolled in the Fall, 1976. These averages are "true" averages at Arizona State University and the University of Arizona, calculated by summing total quality points earned by all students in a group and dividing by the total number of credit hours earned by the same students. At Northern Arizona University, the average entry grade point averages are "simple" averages, calculated by summing individual grade point averages and dividing by the number of students in the group.

Average entry grade point averages for all transfer groups were calculated on previous work completed at the community colleges from which the students transferred. At the University of Arizona "true" entry grade point averages were calculated using hard copy transcripts from the community colleges. However, at Arizona State University and Northern Arizona University, "true" averages could not be calculated for the transfer groups because cuumulative grade point averages earned by transfers at community colleges and reported to universities for admissions decisions were calculated on all graded community college work, including credit hours that did not transfer to the universities and hard copy community college transcripts were not available. "Simple" averages were calculated at these two universities by summing individual entry grade point averages over the number of individuals in a group.

Entry Credit Hours are average credit hours earned in institutions of higher education by all students in a group prior to entry into the study, that is, prior to fall, 1976 for all native and CC1 groups and prior to fall, 1977 for all CC2 groups.

Average entry credit hours were calculated for all native groups on previous work completed at the university in which they were enrolled in the fall, 1976. These averages were calculated by summing total credit hours earned and dividing by number of students in the group. Average entry credit hours for all transfer groups were calculated by summing the number of credit hours transferred to the receiving university upon first-entry into the university in either the fall of 1976 or 1977 and dividing by the number of students in each group.

Cumulative Credit Hours are average cumulative credit hours earned at the three universities by all continuers in a group for each semester subsequent to entry into the study, that is, subsequent to fall, 1976 for all native and CC1 groups and subsequent to fall, 1977 for all CC2 groups.

Average cumulative credit hours earned by the continuers of a group were calculated by summing the total number of credit hours earned by all continuers of that group and dividing by the number of continuers. These averages were calculated for all groups at the three universities in the same way.

College of Transfer is the last college attended by a transfer student previous to entry into one of the universities included in the study.

University College is the college within the university of a student's major curriculum.

At Arizona State University, the university college in which a student in the study was enrolled was defined to be the college in which the student was enrolled in the fall of 1976 for native and CC1 students and in the fall of 1977 for CC2 students. Thus the university college of a student was fixed.

At the University of Arizona, the university college with which a student was identified was the college of the student's major during any given semester. Thus the university college of a student might change after initial enrollment in the college. This difference had little impact upon the disaggregation of data at the two universities by university college.

All other demographic data, that is, sex, age, ethnicity and high school rank, were reported in whatever form they were stored at the different universities in self-explanatory categories.

3. Description of the Study Groups

Data available on the computer master files were used to develop profiles of the native students at each university. The description of the study groups was used to draw inferences about comparability at each university. At Arizona State University and the University of Arizona the figures shown in Table 3.1 represent the total students enrolled in the fall of 1976 and fall of 1977 who met the criteria for selections outlined in Chapter 2. At Northern Arizona University, the numbers represent those students that could be identified given the constraints of the student information system in operation in 1976 and 1977. Because the identification process at NAU produced neither a random sample nor the total population, care has been taken in interpreting the data.

Table 3.1

NATIVE, CC1 AND CC2 STUDY GROUPS AT ARIZONA UNIVERSITIES:

Numbers in Initial Groups

	ASU	U of A	NAU
Native	1,542	2,105	104
CC1	154	130	29
CC2	1,041	183	22

The table provides information about the relative numbers of transfer and native students enrolled at ASU and and U of A making comparable progress toward bachelors degrees in the fall semesters of 1976 and 1977. For these universities, the CC1 groups were small in relation to the numbers of native students suggesting that transfer to a university after the equivalent of one year at a community college is a pattern selected by relatively few students.

At Arizona State, the number of students transferring after approximately two years at an Arizona community college was about two thirds the number of native students. The pattern is quite different at the University of Arizona where the CC2 group contained only 53 students more than the CC1 group and was less than ten percent of the native student group. When these figures are considered in relation to the total numbers of native students at ASU and U of A selected by the study criteria, important differences between the two institutions emerge. The University of Arizona had a third more native students in the study group making what might be termed normal progress than did ASU, despite the fact that its overall enrollment was not as large as ASU's. At the same

time ASU had nearly four times as many transfer students selected for the study groups. Arizona State appears much more dependent upon students transferring from community colleges in Maricopa County and in the State.

While the figures for NAU suggest that it is more like the U of A than ASU in terms of its dependence upon a native student population, the selection process and the numbers identified for the study make such an inference risky.

Demographic Composition, Arizona State University

A demographic profile of the sex, age and ethnicity of the three groups in the study at Arizona State University is contained in Table 3.2. The native group was the most balanced with respect to sex, while the two transfer groups were slightly overrepresented by males. The imbalance was greatest in the CC1 group.

There are differences in the age distributions for the three groups. The native group might be considered a "typical" group of college sophomores. The average age was about nineteen and a half years, and fully 91 percent were either 19 or 20. The CC1 group was older, and the distribution of age less concentrated. Only 51.3 percent of the CC1 group was 19 or 20. More than 35 percent were 22 or older. Obviously, a much higher percentage of CC1 than native students completed secondary school before 1975.

The CC2 group was selected by using 1977 files and so should have averaged at least one year older than both the native and CC1 groups since the latter two were selected using 1976 files. Surprisingly, however, the CC2 group averaged about twenty-four and a half years. More significant was that only 44 percent of the group were clustered in the "typical" 20 to 21 year range. Fifty-four percent were 22 or older, and over thirty-one percent were 25 or older. Clearly the selection criteria used to establish the three groups resulted in the inclusion of many more students who started later and attended part-time more frequently among the CC2 group than for the native group at ASU. The commitment of community colleges to encourage the participation of older, "non-traditional" students resulted in significant differences in the age profiles for the three groups. The most that can be said for the selection criteria in terms of control of the variable of age is that given the data available, the approach used resulted in more comparable groups in terms of levels of progress than would have any available alternative.

The ethnic profile of the three groups indicates some differences, although the significance of these differences is questionable because of the small numbers involved. Minority students seem to be better represented in the transfer groups than in the university native group. Hispanics, in particular, were better represented, accounting for 9.7 percent and 9.0 percent in the CC1 and CC2 groups respectively in contrast with 4.7 percent of the native group. Between 84 and 91 percent

Table 3.2

NATIVE, CC1 AND CC2 STUDY GROUPS AT ASU

By Sex, Age and Ethnicity

	Nat		CC1		CC2	
	Number	%	Number	%	Number	%
Sex:						
Male	759	49.2	90	58.4	566	54.4
Female	783	50.8	64	41.6	475	45.6
Age:						
<17	1	.1	1	.6	1	.1
17	3	.2	0	.0	0	.0
18	46	2.9	4	2.6	1	.1
19	1,185	76.9	44	28.6	13	1.2
20	216	14.0	35	22.7	288	27.7
21	31	2.0	15	9.7	175	16.8
22	13	.8	22	14.3	93	8.9
23	8	.5	9	5.8	80	7.7
24	8	.5	6	3.9	58	5.6
25-30	18	1.2	15	9.7	218	20.9
31-40	7	.5	3	1.9	74	7.1
>40	5	.3	0	.0	40	3.8
Average Age:	19.5		21.2		24.4	
Ethnicity:						
Indian	13	.8	4	2.6	10	1.0
Oriental	22	1.4	2	1.3	11	1.1
Hispanic	73	4.7	15	9.7	94	9.0
Black	41	2.7	4	2.3	26	2.5
Other	1,393	90.3	129	83.8	900	86.5
Totals:	1,542		154		1,041	

of all of the groups is composed of non-minority, presumably Anglo, students.

Demographic Composition, University of Arizona

At the University of Arizona, native students were evenly divided between males and females. Both transfer groups were overrepresented by males on the order of 60 percent to 40 percent.

The differences in ages between native students and the two transfer groups was much less pronounced at the University of Arizona than at Arizona State. When one year is subtracted from the CC2 group to take into consideration the use of 1977 student record tapes for its selection as contrasted with the 1976 tapes used to select the other two groups, there is little more than a year separating all three groups in terms of average age. Thus, the CC2 group at the University of Arizona was more similar in terms of age to the native group and the CC1 group than it was to the CC2 group at Arizona State.

While the data suggest that minority students are better represented at the University of Arizona in the native group than in the two community college transfer groups, the data must be interpreted with caution. Only 48 percent of the native students had reported this data and the numbers of transfers were limited.

Demographic Composition, Northern Arizona University

Table 3.4 details the sex and age composition of the three study groups at Northern Arizona University.

The native group was almost evenly divided between males and females, 51.9 percent to 48.1 percent respectively. The two transfer groups were somewhat less balanced. The CC1 group was overrepresented by females and the CC2 group by males. However, the percent differences were larger than the absolute differences of males and females in the two groups largely because the number of students in both transfer groups was so small. In fact, the total number of male transfers in both groups was just one more than the total number of female transfers in both groups combined. Overall, the three study groups at Northern Arizona University were reasonably well-balanced with respect to numbers of men and women.

There were differences in the age distributions of the three groups. Nearly ninety percent of the native group was 21 or younger, while only 51.7 percent of the CC1 group was 21 and under. While the CC2 group was expected to average a year older than the other two groups, only about fifty-five percent of the CC2 group was 22 and younger. The transfer groups, then, were composed of students that are on the average older than the native university groups. However, the differences among the average ages of the three groups at Northern Arizona University were less than the differences among the same groups at both Arizona State

Table 3.3

NATIVE, CC1 AND CC2 STUDY GROUPS AT U OF A

By Sex, Age and Ethnicity

	Nat			CC1		CC2	
	Number	%	% Respondents	Number	%	Number	%
Sex:							
Male	1,063	50.5		79	60.8	109	59.6
Female	1,042	49.5		51	39.2	74	40.4
Average Age:	19.6			20.3		22.1	
Ethnicity:							
Indian	11	.5	1.1	0	.0	0	.0
Black	22	1.0	2.2	2	1.5	1	.6
Oriental	23	1.1	2.3	0	.0	0	.0
Spanish	103	4.9	10.2	10	7.7	24	13.1
Other	854	40.6	84.3	118	90.8	158	86.3
Not Reported	1,092	51.9	--	0	.0	0	.0
Totals:	2,105			130		183	

Table 3.4

NATIVE, CC1 AND CC2 STUDY GROUPS AT NAU
By Sex and Age

	Nat		CC1		CC2	
	Number	%	Number	%	Number	%
Sex:						
Male	54	51.9	13	44.8	13	59.1
Female	50	48.1	16	55.2	9	40.9
Age:						
<17	0	.0	0	.0	0	.0
17	1	.1	0	.0	0	.0
18	5	4.8	0	.0	0	.0
19	8	7.7	5	17.2	0	.0
20	34	32.7	4	13.8	5	22.7
21	43	41.3	6	20.7	1	4.5
22	10	9.6	9	31.0	6	27.3
23	3	2.9	4	13.8	3	13.6
24	0	.0	1	3.4	3	13.6
25-30	0	.0	0	.0	4	18.2
31-40	0	.0	0	.0	0	.0
>40	0	.0	0	.0	0	.0
Average Age*	20.5		21.2		22.9	
Totals:	104		29		22	

*The average age was calculated using the midpoint of the 25-30 interval as the average age of the four CC2 students in that interval.

University and the University of Arizona. The natives at Northern Arizona University appear a bit older than the natives at the other two universities, while the transfers at Northern Arizona University were not as old as the transfers at Arizona State University.

In general, the age distribution of the three groups at Northern Arizona follows the same pattern as those at the other two universities included in the study.

Data on the ethnic composition of the three study groups was not available at Northern Arizona University.

Distribution by Colleges, Arizona State University

Table 3.5 details the distribution of students in the three groups among the university colleges of Arizona State University and the Arizona Community colleges from which students transfer.

The four major university colleges in which students from all three groups were enrolled were the colleges of Liberal Arts, Business Administration, Engineering and Fine Arts. The distribution of students in these colleges was quite similar for all three groups. The data for the College of Education requires explanation. The College of Education does not enroll students until their junior years. Only students from the CC2 groups were, therefore, eligible for selection. However the combined total of students enrolled in the colleges of Liberal Arts and in Education in the CC2 group represents almost exactly the same percentage of students enrolled in the College of Liberal Arts for the other two groups. Most students preparing for entrance into the College of Education are initially enrolled in the College of Liberal Arts.

Other minor but interesting differences among the three groups were the slight preference for the colleges of Public Programs and Social Work on the part of transfers from community colleges and less interest in the colleges of Engineering and Applied Sciences and Fine Arts. Overall, however, the similarities were much more apparent than the differences, and these similarities appeared sufficient to permit comparisons among the three groups without distorting results because of differences among the university colleges in which the students were enrolled.

The distribution of students according to the community colleges last attended before transfer to Arizona State University is also detailed in Table 3.5. The four largest colleges in the Maricopa County Community College District, Mesa, Scottsdale, Glendale, and Phoenix were the major contributors of transfer students for both the CC1 and CC2 groups. In fact, none of the other ten public community colleges in the State contributed more than three percent to either group at Arizona State University. Mesa Community College and Phoenix Community College contributed the greatest number of students to the smaller CC1 group, while Mesa and Glendale were the principal contributors to the CC2 group.

Table 3.5

NATIVE, CC1 AND CC2 STUDY GROUPS AT ASU

By University College and
College of Transfer

	Nat		CC1		CC2	
	Number	%	Number	%	Number	%
University College:						
Liberal Arts	773	50.1	83	53.9	404	38.8
Education	3	.2	0	.0	109	10.4
Business Administration	325	21.0	32	20.8	255	24.5
Engineering	193	12.5	19	12.3	97	9.3
Architecture	0	.0	0	.0	1	.1
Public Programs	26	1.7	5	3.2	45	4.3
Nursing	46	3.0	1	.6	26	2.5
Social Work	3	.2	3	1.9	38	3.7
Fine Arts	173	11.2	11	7.1	66	6.3
College of Transfer:						
Arizona Western			2	1.3	27	2.6
Central Arizona			4	2.6	23	2.2
Cochise			3	1.9	7	.7
Eastern Arizona			2	1.3	11	1.1
Glendale			23	14.9	259	24.9
Northland Pioneer			0	.0	3	.3
Maricopa Tech			2	1.3	25	2.4
Mohave			0	.0	0	.0
Mesa			40	26.0	302	29.0
Phoenix			50	32.5	233	22.4
Pima			1	.6	9	.9
Scottsdale			24	15.6	127	12.2
Yavapai			2	1.3	15	1.4
Arizona College Tech			1	.6	0	.0
Totals:	1,542		154		1,041	

Mesa Community College and Scottsdale Community Colleges were the most consistent contributors of transfers to Arizona State University, sending similar percentages of students to the university after one and two academic years. Students from Glendale Community College appeared much more likely to transfer after completing two years of academic work. Phoenix College, in contrast, sent a smaller percentage of its transfer after two years than after one.

Distribution by Colleges, University of Arizona

Table 3.6 details the distribution of students among university colleges of the University of Arizona upon entry into the study and the distribution of the students in the two transfer groups among the Arizona community colleges from which they transferred.

The only university colleges in which significant percentages of students of all three groups were enrolled were the colleges of Liberal Arts and Business and Public Administration. The percentages of each group enrolled in the College of Liberal Arts were roughly similar, particularly if the CC2 students enrolled in the College of Education are combined with the CC2 students in the College of Liberal Arts. Allowing for this similarity, the distribution of students in university colleges at the University of Arizona contained significant variation among the three groups.

The College of Business enrolled a significant percentage of the students from each group, but students transferring from a community college after two years were enrolled at nearly twice the rate of those transferring after one. Native students were represented at a rate between these two extremes. The College of Engineering was more likely to attract native students than transfer students. The Colleges of Fine Arts and Agriculture enrolled similar percentages of native and CC2 groups. Fewer CC1 students enrolled in the College of Fine Arts than from the other two groups. The College of Agriculture attracted CC1 students at nearly twice the rate as for natives and CC2's.

In general, native students at the University of Arizona were distributed across a broader range of university colleges than the transfer groups. Natives were well represented in the major university colleges, while CC1 and CC2 transfer students were concentrated more narrowly in the colleges of Business and Public Administration and Liberal Arts. Because relatively few community college transfer students were produced by the selection criteria, it was not unexpected that transfer students were concentrated in the larger university colleges. These differences in the distribution of students among university colleges must be considered in interpreting the performance data provided.

The distribution of students according to community colleges last attended is also detailed in Table 3.6. The largest contributor to the University was, of course, Pima Community College, the public community

Table 3.6

NATIVE, CC1 AND CC2 STUDY GROUPS AT U OF A

By University College and
College of Transfer

	Nat		CC1		CC2	
	Number	%	Number	%	Number	%
University College:						
Agriculture	155	7.4	18	13.9	13	7.1
Home Economics	85	4.0	4	3.1	6	3.3
Business and Public Admin.	357	17.0	16	12.3	43	23.5
Education	2	.1	0	.0	31	17.0
Engineering	165	7.8	7	5.4	8	4.4
Fine Arts	187	8.9	3	2.3	14	7.7
Health Rel. Prof.	0	.0	0	.0	0	.0
Liberal Arts	956	45.4	69	53.1	64	35.0
Mines	60	2.9	5	3.9	1	.6
Nursing	93	4.4	1	.8	1	.6
Pharmacy	0	.0	0	.0	0	.0
Architecture	45	2.1	3	2.3	1	.6
Earth Sciences	0	.0	4	3.1	1	.6
College of Transfer:						
Arizona Western			9	6.9	13	7.1
Central Arizona			11	8.5	10	5.5
Cochise			9	6.9	20	10.9
Eastern Arizona			3	2.3	9	4.9
Glendale			15	11.5	17	9.3
Maricopa Tech			0	.0	1	.6
Mesa			9	6.9	7	3.8
Mohave			2	1.5	0	.0
Northland Pioneer			0	.0	0	.0
Phoenix			14	10.8	17	9.3
Pima			46	35.4	82	44.8
Scottsdale			9	6.9	6	3.3
Yavapai			3	2.3	1	.6
Arizona College Tech			0	.0	0	.0
Totals:	2,105		130		183	

college serving metropolitan Tucson. Transfers from Pima Community College were three to four times more numerous than transfers from the next largest contributing colleges. The other major contributing colleges were in the Maricopa County Community College District and included Phoenix and Glendale, which were also major contributors to the transfer groups at Arizona State. In fact, the four major Maricopa County community colleges sent as many students in the CC1 group as did the campuses of Pima Community College. Pima dominated as a contributor to the CC2 group with Cochise College contributing the second largest number.

In general, the number of students in both transfer groups were small, particularly in comparison with the native group at the University of Arizona and the large CC2 group of community college transfers selected at Arizona State.

Northern Arizona University

A breakdown of the three study groups at Northern Arizona University by university college and college of transfer was not available. However, the small number of students contained in each selected group, particularly in the transfer groups, made a disaggregation into smaller groups an exercise of limited value.

4. Persistence

Persistence was defined for the purposes of this study as the percentage of the original population of each group still enrolled, or having graduated by earning a total of 124 or more credit hours, during any semester. Thus the persistence rate of any group of native or CC1 students was one hundred percent during the fall semester of 1976 and decreased thereafter as students failed to return. Similarly, the persistence rate of any group of CC2 students was one hundred percent during the fall of 1977 when they were selected into the study; their persistence rate decreased during succeeding semesters as some of their number did not return. Because the actual numbers of students who were determined to be continuers, dropouts and graduates during any semester varied considerably for each group, persistence was defined in terms of percentages of the original number in attendance for that semester. Inter-group comparisons, therefore, were possible.

The method used to calculate persistence rates was quite straightforward. At each university and for each group, an original population was defined and the number of this population noted. For each succeeding semester, the study identified students of this original population who continued to be enrolled on the 21st day, those who were not enrolled on the 21st day, and those who had graduated the previous semester. The continuers were added to the graduates, and this total was divided by the number in the original group to give the persistence rate for that group for that semester. As was noted earlier in the section concerned with definitions, students were allowed to dropout and reenter the study; however, once a student was determined to have graduated by the definitions employed in this study, that student continued to be defined as a graduate for all succeeding semesters.

Some problems occurred in the determination of the numbers of continuers, dropouts and graduates. At both Arizona State University and the University of Arizona, a few of the students originally selected into the three groups were determined to have graduated "impossibly early." That is, occasionally a student who had apparently met the selection criteria and had been selected as a member of one of the original groups appeared in some subsequent semester to be a graduate when even well above normal academic progress would not have made it possible for that student to have accumulated the required 124 credit hours. It was assumed that these students--and there were very few or none in each group--had probably transferred a significant number of credit hours from other institutions after having been selected as one of the original group members. To take this problem into consideration, no students were allowed to graduate before the end of the fall semester of 1978, five semesters after entry into the study for the native and CC1 groups and three semesters after entry for the CC2 group. All students who appeared as graduates before that time were subtracted from the original number in each group and from the number of group graduates. Thus, the numbers reported in sections concerning persistence, progress and performance of this study are slightly less than those reported as originally selected

for each group. At Northern Arizona University, the problem of early graduates did not occur, for their manual method of following students' progress allowed them to determine a student's status on a case by case basis.

Arizona State University

The persistence rates of each of the three groups at Arizona State University for the eight semesters in this study are detailed in table 4.1.

The overall persistence rate for the native group declined gradually to 63.0 percent, indicating that by eight semesters after the original group of natives had entered the study as academic sophomores 63 percent were either still enrolled or had graduated. The group of students who transferred after completing one year of academic credit from the community college to the university persisted at a much lower rate. The persistence rate for the CC1 group declined to 36.1 percent eight semesters after entry into the university. This represents greater than a 60 percent attrition rate for the original group.

The persistence rates of the CC2 group, composed of students who had transferred to the university after completing two years of academic credit at the community college, were much more comparable to the rates for the native group. In fact, the persistence rates of the native and CC2 groups were within four percentage points for the last three or four semesters of the study. It must be noted that the CC2 group entered the university and the study a year after the native and CC1 groups were selected for the study. As a result, the persistence rates of the CC2 group are not directly comparable to the other two groups for the first two or three semesters after the CC2 group entered. However, the cumulative persistence rate of the CC2 group, that is the percentage of the original group either still enrolled or having graduated by the spring of 1980, was quite similar to the cumulative persistence rate of the native group in the same semester and much higher than the cumulative persistence rate of the other transfer group. At Arizona State University, the greater the number of credit hours earned in the community college, the more likely transfer students were to persist.

The literature on previous studies of community college transfers has documented the fact that whatever differences might be found in persistence rates, progress and performance of community college transfers and university natives tend to disappear when differences in the high school ranks of the students are controlled. The results of this study at ASU confirms this trend. The retention rates of all three groups improved when only those in the top 50 percent of their high school classes were included, and the differences among the three groups lessened considerably. In fact, the retention rate of the CC2 group by spring 1980 exceeded that for the native group. The retention rates of the native and CC2 groups improved again when only those in the top 20 percent of their high school graduating classes were included. The

Table 4.1

PERSISTENCE

Retention Rates At ASU: Aggregate and by High School Rank

	Aggregate			Top 50%			Top 20%		
	Nat	CC1	CC2	Nat	CC1	CC2	Nat	CC1	CC2
Number at Entry	1,517	147	1,022	1,256	30	249	707	10[b]	109
Fall 76	100.0	100.0		100.0	100.0		100.0		
Spring 77	93.3	80.3		94.0	86.7		95.0		
Fall 77	81.1	61.2	100.0	82.[illegible]	66.7	100.0	85.4		100.0
Spring 78	77.3	55.8	85.8	79.3	66.7	90.8	82.2		90.8
Fall 78	73.8	45.6	72.1	76.3	63.3	80.3	79.8		79.8
Spring 79	71.8	46.3	67.1	74.6	66.7	75.5	78.8		75.2
Fall 79	63.9	40.1	59.4	66.5	50.0	68.7	71.0		72.5
Spring 80	63.0	36.1	58.6	65.5	43.3	67.5	70.7		68.8

[a]High school rank data not available for all cases. Number in Top 50% and Top 20% does not indicate percent of total groups having graduated in those ranks in their high school classes.

[b]Number in group insufficient to report meaningful results.

difference in the retention rates of these two groups was less than two percentage points.

The number of CC1 transfers identified in the top 20 percent of their high school graduating classes was too small to report meaningful data for that group. However, the fact that only ten CC1 transfers were identified in the top 20 percent of their classes does not mean than only ten were actually in that group. Because only limited high school rank data were available for community college transfers at Arizona State University, the percent of the original group of transfers identified in the top ranks of their high school graduating classes does not represent the actual percentage that did graduate in those ranks. The high school rank data for natives at Arizona State University were more complete, but similar caution must be exercised in inferring the actual percent of the original groups in the top ranks of their high school graduating classes.

Table 4.2 details the persistence rates for native, CC1 and CC2 groups disaggregated by university college. The university colleges detailed in the table are the four major colleges at Arizona State University in which students in all three study groups were enrolled. However, the numbers of CC1 transfers identified in the colleges of Engineering and Fine Arts were insufficient to report meaningful results for those colleges.

The data confirm the previously noted trend for CC1 transfers to persist at significantly lower rates than either native students or CC2 transfers, though the differences among the groups were less in the colleges of Business Administration and Liberal Arts than for the aggregate groups as a whole. CC2 transfers persisted at rates much more comparable to those of the native students, particularly in the College of Business Administration where the retention rates of the two groups were virtually the same. The notable exception to this trend was the College of Engineering. Native students in the College of Engineering persisted at rates that exceed the rates of any other group in the study at Arizona State University. The difference between the retention rates of the native and CC2 groups was substantial and suggests that native students have a comparative advantage over transfers in that college.

Inter-college comparisons are possible using the data contained in Table 4.2. It appears for instance, that the persistence rates for students in the colleges of Business Administration and Liberal Arts were close to the average found at Arizona State University as a whole, and that the persistence rates for native students in the College of Engineering were substantially higher than average. However, since the purpose of this study was to compare community college transfer students with native university students, no attempt was made to explain inter-college trends that appeared in the tabled data.

Table 4.3 details the persistence rates of community college transfers disaggregated by the colleges from which they transferred and allows comparisons with the persistence rates of the aggregate native

Table 4.2

PERSISTENCE

Retention Rates at ASU: By University College

	Business			Liberal Arts			Engineering			Fine Arts		
	Nat	CC1	CC2	Nat	CC1	CC2	Nat	CC1	CC2	Nat	CC1	CC2
Number at Entry	318	30	249	762	82	401	192	16[a]	95	170	11[a]	65
Fall 76	100.0	100.0		100.0	100.0		100.0			100.0		
Spring 77	95.6	86.7		91.6	76.8		93.8			92.9		
Fall 77	84.3	73.3	100.0	79.4	62.2	100.0	85.4		100.0	78.2		100.0
Spring 78	79.9	66.7	85.9	76.5	58.5	86.8	82.3		87.4	71.2		86.2
Fall 78	75.5	46.7	73.5	71.8	50.0	71.8	81.3		71.6	70.0		69.2
Spring 79	72.3	53.3	69.1	70.2	50.0	67.1	77.1		69.5	59.4		55.4
Fall 79	61.3	40.0	59.0	62.2	45.1	58.4	77.1		67.4	60.0		50.8
Spring 80	61.6	43.3	60.2	60.0	40.2	55.9	78.6		65.3	61.2		52.3

[a]Number in group insufficient to report meaningful results.

Table 4.3

PERSISTENCE

Retention Rates at ASU: by College of Transfer

	Aggregate	Glendale CC		Mesa CC		Phoenix CC		Scottsdale CC	
	Nat	CC1	CC2	CC1	CC2	CC1	CC2	CC1	CC2
Number of Entry	1517	22	256	39	298	47	225	23	125
Fall 76	100.0	100.0	100.0	100.0		100.0		100.0	
Spring 77	93.3	86.4		82.1		78.7		78.3	
Fall 77	81.1	72.7	100.0	64.1	100.0	55.3	100.0	65.2	100.0
Spring 78	77.3	63.6	86.7	51.3	85.6	53.2	84.4	65.2	87.2
Fall 78	73.8	72.7	76.6	43.6	68.1	38.3	71.1	43.5	76.0
Spring 79	71.8	54.5	71.5	43.6	63.8	40.4	68.0	56.5	66.4
Fall 79	63.9	50.0	65.2	41.0	55.0	38.3	57.8	34.8	63.2
Spring 80	63.0	31.8	63.7	41.0	56.0	36.2	56.0	39.1	61.6

group. The four colleges detailed in the table were the community colleges which contributed the most students to the two transfer groups at Arizona State University. The data on the persistence rates of the four CC1 groups indicate that CC1 transfers did not compare favorably with natives in persistence rates. The data on the CC2 groups at Glendale Community College and Scottsdale Community College indicate that not only did CC2 transfers from these institutions compare favorably with natives but, also, in the case of Glendale, community college students who transferred to Arizona State University after two years of academic work actually persisted at higher rates than native university students. In the previous section it was noted that Glendale contributed at twice the rate to the CC2 group than it did to the CC1 group. The retention rates of the CC2 groups from Mesa Community College and Phoenix Community College were identical, and both compared reasonably well to the retention rates of the native group, 56 percent to 63 percent respectively.

University of Arizona

Table 4.4 reports the persistence rates of each of the three groups of students for the eight semesters at the University of Arizona. The persistence rates of the aggregate groups indicate that the trends noted previously at Arizona State University hold true at the University of Arizona. The persistence rates of the CC1 group declined more sharply than the rates for the native group, and the overall persistence rate for CC1 students eight semesters after entry into the study at the University of Arizona was significantly lower than the overall persistence rate of the native group. Also as at Arizona State, the persistence rates of the CC2 group appeared quite comparable to those of the native group. By the spring of 1980, the numbers of original members of the two groups still enrolled in the university or having graduated were in the 62-64 percent range. Again, it appears that those community college students who transferred after completing two years of academic work work were more likely to persist at the university than those who transferred after only one year.

The data on the persistence rates of the three groups of students at the University of Arizona disaggregated by the high school ranks of the students in the three groups present a more complicated picture. Including only those students in the three groups that had graduated in the top 50 percent of their high school classes resulted in slightly higher persistence rates for all three groups. However, after remaining roughly comparable with the rates of the native group for four semesters, the overall persistence rate of the CC1 group dropped significantly below the persistence rate for native students. The persistence rates for the CC2 students in the top 50 percent of their high school classes were essentially the same as for the entire group.

The persistence rates for individuals in each of the three groups who graduated in the top 20 percent of their high school classes demonstrated a sharp increase in persistence rates for all three groups, but particularly for the transfer groups where cumulative persistence rates

Table 4.4

PERSISTENCE

Retention Rates at U of A: Aggregate & By High School Rank[a]

	Aggregate			Top 50%			Top 20%		
	Nat	CC1	CC2	Nat	CC1	CC2	Nat	CC1	CC2
Number at Entry	2093	130	182	1648	76	103	920	33	37
Fall 76	100.0	100.0		100.0	100.0		100.0	100.0	
Spring 77	99.9	99.2		100.0	100.0		100.0	100.0	
Fall 77	77.6	73.8	100.0	80.0	81.6	100.0	84.2	84.8	100.0
Spring 78	73.1	67.7	89.6	75.3	76.3	90.3	79.8	75.8	100.0
Fall 78	68.5	62.3	72.5	71.6	65.8	73.8	77.4	72.7	89.2
Spring 79	65.7	60.0	70.3	68.8	65.8	70.9	75.8	66.7	83.8
Fall 79	62.5	53.1	61.0	65.6	56.6	63.1	72.1	72.7	78.4
Spring 80	63.8	54.6	62.1	66.6	56.6	63.1	72.7	72.7	78.4

[a]High school rank data not available for all cases. Number in Top 50% and Top 20% does not indicate percent of total groups having graduated in those ranks in their high school classes.

either equaled or exceeded the rate for the native group. The persistence rate of the CC2 group in the spring of 1980 was 78.4 percent, the highest yet noted for any group, and significantly higher than the native group's 72.7 percent cumulative persistence rate. Graphic representations of these persistence rate comparisons are included in Appendix C.

The data suggest that when the variable of high school rank was controlled the three comparison groups exhibited quite similar persistence rates. However, the numbers of students in the transfer groups were so small, especially in terms of community college transfers who had graduated in the top ranks of their high school classes that chance cannot be excluded as an explanation of the observed results. In fact, the persistence rates of the CC1 students in the top 20 percent of their high school classes did indicate some erratic declines and rises.

Table 4.5 details the persistence rates of the three groups disaggregated by university college. Data for all three groups is presented only for the College of Business and Public Administration and the College of Liberal Arts because the numbers of CC1 and CC2 students in the other colleges were not large enough for meaningful comparisons. The persistence rates of the two colleges presented in Table 4.5 confirm previously noted information for the University of Arizona. CC1 transfers persisted at lower rates than the other two groups and persisted less well in the College of Liberal Arts. The CC2 transfer group persisted at rates similar to the rates for the native group, although the overall persistence rates of the native groups were slightly higher. The College of Engineering enrolled native students with a high likelihood of persisting; this observation was also noted at Arizona State University.

Table 4.6 reports the persistence rates of the two transfer groups disaggregated by the community colleges from which they transferred. The persistence rates for the aggregate native group is also included to permit comparisons. Only Pima Community College sent enough transfer students to produce meaningful persistence rate comparisons. CC1 transfers from Pima Community College exhibited persistence rates significantly lower than those for native university students. CC2 transfers exhibited rates quite comparable to native rates. In this case, the cumulative persistence rate for CC2 transfers was slightly higher than for the native group.

Northern Arizona University

The data contained in Table 4.7 indicating the persistence rates for the three groups at Northern Arizona University exhibits rather sharp rises and declines in persistence rates that were not found in any other group comparisons. The cumulative persistence rate of the CC1 group was considerably higher than the rate for either the CC2 group or the native group. In fact, the native group had the lowest overall persistence

Table 4.5

PERSISTENCE

Retention Rates at U of A: By University College

	Business			Liberal Arts			Engineering			Fine Arts		
	Nat	CC1	CC2	Nat	CC1	CC2	Nat	CC1	CC2	Nat	CC1	CC2
Number at Entry	387	17	41	895	67	62	160	7[a]	3[a]	187	8[a]	14[a]
Fall 76	100.0	100.0		100.0	100.0		100.0			100.0		
Spring 77	100.0	100.0		99.9	98.5		100.0			100.0		
Fall 77	78.1	72.2	100.0	73.1	68.9	100.0	88.1			73.8		
Spring 78	74.5	71.4	87.8	65.4	63.0	87.1	84.3			67.7		
Fall 78	72.6	60.0	68.3	59.0	50.0	68.9	78.1			59.4		
Spring 79	69.6	57.1	62.5	54.3	44.9	63.8	76.1			58.8		
Fall 79	63.8	50.0	62.5	51.1	34.0	50.0	75.4			50.3		
Spring 80	65.4	52.4	62.5	52.6	36.0	50.9	77.5			52.1		

[a]Number in group insufficient to report meaningful results.

Table 4.6

PERSISTENCE

Retention Rates at U of A: By College of Transfer

	Aggregate	Pima CC		Cochise CC		Glendale CC		Phoenix CC	
	Nat	CC1	CC2	CC1	CC2	CC1	CC2	CC1	CC2
Number of Entry	2,093	46	82	9[a]	19	15	17	14	17
Fall 76	100.0	100.0				100.0		100.0	
Spring 77	99.9	97.8				100.0		100.0	
Fall 77	77.6	69.6	100.0		100.0	66.7	100.0	85.7	100.0
Spring 78	73.1	58.7	84.2		94.7	60.0	100.0	78.6	88.2
Fall 78	68.5	58.7	69.5		73.7	46.7	94.1	78.6	76.5
Spring 79	65.7	52.2	70.7		73.7	46.7	82.4	78.6	76.5
Fall 79	62.5	43.5	63.4		68.4	40.0	64.7	71.4	58.8
Spring 80	63.8	45.7	64.6		68.4	40.0	64.7	71.4	58.8

[a]Number in group insufficient to report meaningful results.

Table 4.7

PERSISTENCE

Retention Rate at NAU: Aggregate

	Aggregate		
	Nat	CC1	CC2
Number at Entry	101	27	19
Fall 76	100.0	100.0	
Spring 77	83.2	88.9	
Fall 77	80.2	85.2	100.0
Spring 78	83.2	85.2	89.5
Fall 78	65.3	59.3	47.4
Spring 79	44.6	63.0	42.1
Fall 79	42.6	77.8	31.6
Spring 80	41.6	66.7	52.6

rate, thus reversing the trends in persistence rates found at the other universities.

However, the small numbers of students in the two transfer groups and the abrupt declines and sharp rises in the persistence rates over the six or eight semesters of the two transfer groups raises questions about the adequacy of the data. In all previous data, the only cases where a group's persistence rates declined and then rose again in subsequent semesters were those containing thirty or fewer students. Of the three groups at Northern Arizona University, only the native group contained more than thirty students, and it alone demonstrated the steadily declining rate of persistence that was expected and has been previously demonstrated as normative behavior for the other two universities. The persistence rate of the CC1 group was as low as 59.3 percent and then increased to a high of 77.8 percent in subsequent semesters. The rates for the CC2 group declined to 31.6 percent before rebounding to 52.6 percent the next semester. These apparent discrepancies suggest a need for further examination and validation of the trends at Northern Arizona.

5. Performance

For the purposes of this study, performance was defined as the average cumulative grade point average of the continuers for each successive semester during the study. Of particular interest was the comparison among the average cumulative grade point average of the total population of each group on entry into the study and the average cumulative grade point averages of the continuers in each group for each subsequent semester after entry into the study. A discussion of the method used to calculate average cumulative grade point averages is contained in the section on methodology. The point to be emphasized here is that these averages were calculated initially for the total groups, but in following semesters only for those students in each group that continued to be enrolled.

In order to allow direct comparisons of the performance of all three major groups in the study, average cumulative grade point averages were reported by the ordinal semester after entry into the study for each group. Thus it is possible to compare the performance of native and CC1 students in their first semesters after entry into the study with the performance of CC2 transfers in their first semesters, even though the first two groups earned their first semester grades during the fall of 1976 while the last group was first enrolled in the university during the fall of 1977. This manner of reporting performance measures provides the best view of the performance of each group in progressive semesters relative to their entry grade point averages.

Average cumulative grade point averages are reported for only five semesters after entry into the study for native and CC1 transfers and for only three semesters for CC2 transfers. The decision to exclude the final two semesters of performance measures for each group was made because the average cumulative grade point averages for all groups declined drastically after the fall semester of 1978. This decline was the result of the loss of significant numbers of the better students to graduation in the spring of 1979 and thereafter. The average cumulative grade point average for continuers who did not graduate on a four-year schedule was considerably lower than the average of continuers who did manage to graduate on schedule. The five and three semesters for which grade point averages were calculated and reported proved sufficient to provide comparisons of the academic performances of each group.

The performance measures used in the study were derived from student record tapes for the 21st day of the eight semesters from fall, 1976 to spring, 1980 inclusive. The cumulative grade point averages on each student's records thus reflected only work completed through the previous semester. For example, the average cumulative grade point average of any group of students reported from the student record tapes of the 21st day of the spring, 1979 tape was actually the average cumulative grade point average of continuers through the fall, 1978. For this reason performance measures were available for only seven of the eight semesters

included in the study; grade point averages for spring, 1980 will not be available until the 21st day of the fall, 1980 semester.

Arizona State University

Table 5.1 details the average cumulative grade point averages of the native CC1 and CC2 groups at Arizona State University. The entry grade point average for the native group was the one earned at Arizona State University prior to entry into the study in the fall of 1976; the entry grade point averages of the two transfer groups were earned at the community colleges from which CC1 and CC2 group members transferred. The grade point averages after entry into the study were average cumulative grade point averages as previously defined for all three groups.

All three groups exhibited a drop from their entry averages during the first semester. The native group experienced the smallest drop, a drop of only .02 of a point. The CC2 group experienced a drop in the first semester's grade point average of .47 of a point, and the CC1 group experienced a drop of .58. All three groups recovered from these drops in the level of their academic performance during the first semester and then increased their average cumulative grade point averages during the remaining semesters of the study. The transfer groups recorded the largest increase from first semester's cumulative averages; however, native students maintained the highest overall average.

There were differences in the academic performance of the three groups as measured by the grade point averages. The native students performed somewhat better overall than the two transfer groups, while the CC2 group performed at a more comparable level than those who transferred from the community college after only one year. The CC1 students entered the study at a lower performance level than the other two groups, then, raised their performance the most, though not to the level set by the native group. The CC2 group maintained a performance level slightly lower than the native group after recovering from its first semester decline.

The data on the performance measures of the three aggregate groups at Arizona State University display the much discussed "transfer shock" phenomenon. The data indicate a difference, averaging about a half of a grade point, between the cumulative grade point average earned during the first semester at the university from the cumulative grade point average earned at the community college for both transfer groups. This drop in grade point average, or transfer shock, might be attributed to differential grading standards at the university and the community college or to the need for community college transfers to become oriented to the new environment and requirements of the university. Nonetheless, the data also indicate that transfers recovered from this shock almost immediately and raised their cumulative grade point averages each succeeding semester after the initial semester of university work.

Table 5.1

PERFORMANCE

Cumulative Grade Point Averages at ASU: Aggregate and by High School Rank

	Aggregate			Top 50%			Top 20%		
	Nat	CC1	CC2	Nat	CC1	CC2	Nat	CC1	CC2
ntry	2.79	2.86	3.09	2.84	3.10	3.23	3.06		3.42
st Semester	2.77	2.28	2.62	2.81	2.35	2.71	3.02		2.83
nd Semester	2.89	2.52	2.82	2.92	2.54	2.89	3.12		3.06
rd Semester	2.93	2.61	2.82	2.96	2.71	2.90	3.14		3.08
th Semester	2.97	2.74		3.00	2.76		3.17		
th Semester	2.97	2.74		3.00	2.77		3.16		
Number	1517	147	1022	1256	30	249	707	10[a]	109

[a] Number in group insufficient to report meaningful results.

The data on the three groups including only those in the top 50 percent and 20 percent of their high school graduating classes indicate that the differences among the groups diminished when high school rank was controlled. The difference between the final cumulative grade point average of the native and CC2 groups diminished from .15 to .08. The transfer shock phenomenon was still apparent for the transfer groups as the CC1 and CC2 groups including only those in the top 50 percent and 20 percent of their high school classes earned considerably higher grade point averages at the community college.

The average grade point averages of the three groups disaggregated by the four major university colleges in which study group members were enrolled demonstrate some distinct differences. These results are detailed in Table 5.2. The transfer shock phenomenon occurs for all transfer groups of all four university college groups. Again, in all cases, the transfer students rebounded from these initial drops in grade point averages and continued to improve each succeeding semester, but in no case, did they achieve a performance level quite equal to that of the native student groups. The transfer shock decline in first semester grade point average averaged .56 for the transfer groups of sufficient size to report data in the Colleges of Business Administration, Engineering and Fine Arts. The difference in the final cumulative grade point averages of the transfer groups averaged about .25 of a point less than the native groups in these colleges. Again, the CC2 groups were more comparable to the natives. However, the differences between the native group and the transfer groups in the College of Liberal Arts were considerably less. The transfer shock decline averaged about .35 of a point for the two transfer groups in the College, and the difference in the final grade point averages of the groups was only .10 of a point.

Overall, the data indicate that the native students achieved slightly higher academic performance levels than the two transfer groups. Yet the differences tended to be leveled for each succeeding semester, and in all cases, the differences were less than .38 of a point, usually in the neighborhood of .25 of a grade point.

Table 5.3 provides information about the academic performance of the transfer groups from the four community colleges contributing the largest number of transfers to ASU. Declines in grade point averages earned during the first semester at the university from those grade point averages earned at the community college were most drastic in the CC1 transfer groups at Phoenix and Scottsdale Community Colleges. The average decline of the two transfer groups at Scottsdale Community College was the largest of the four colleges, .59 of a point, while the transfer shock decline at Glendale Community College was the smallest on the average. The final cumulative grade point averages earned by the CC2 group at Glendale Community College and the CC1 and CC2 groups at Mesa Community College were within .07 of a point of the cumulative average of the native group. Overall, the academic performances of the transfer groups from these four community colleges more closely approximated the performance of the native group than did the performances of the aggregate transfer groups that included all Arizona community colleges.

Table 5.2

PERFORMANCE

Cumulative Grade Point Averages at ASU: By University College

	Business			Liberal Arts			Engineering			Fine Arts		
	Nat	CC1	CC2	Nat	CC1	CC2	Nat	CC1	CC2	Nat	CC1	CC2
Entry	2.75	2.77	3.02	2.76	2.92	3.10	2.83		3.04	2.93		3.21
1st Semester	2.72	2.18	2.47	2.78	2.65	2.66	2.71		2.48	2.88		2.67
2nd Semester	2.82	2.32	2.65	2.91	2.69	2.89	2.79		2.70	3.03		2.78
3rd Semester	2.86	2.31	2.66	2.95	2.79	2.89	2.83		2.66	3.08		2.82
4th Semester	2.89	2.63		3.00	2.84		2.85			3.13		
5th Semester	2.93	2.55		2.99	2.89		2.84			3.09		
Number	318	30	249	762	82	401	192	16[a]	95	170	11[a]	65

[a]Number in group insufficient to report meaningful results.

Table 5.3

PERFORMANCE

Cumulative Grade Point Averages at ASU: By College of Transfer

	Aggregate	Glendale CC		Mesa CC		Phoenix CC		Scottsdale CC	
	Nat	CC1	CC2	CC1	CC2	CC1	CC2	CC1	CC2
Entry	2.79	2.90	3.10	2.97	3.16	2.76	3.02	2.92	3.08
1st Semester	2.77	2.57	2.69	2.45	2.59	2.14	2.63	2.29	2.54
2nd Semester	2.89	2.60	2.93	2.62	2.79	2.46	2.84	2.49	2.69
3rd Semester	2.93	2.60	2.90	2.85	2.90	2.46	2.83	2.68	2.77
4th Semester	2.97	2.59		2.87		2.75		2.89	
5th Semester	2.97	2.74		2.90		2.70		2.88	
Number	1517	22	256	39	298	47	225	23	125

Eventually, all transfer groups from these Maricopa County Community Colleges were within a quarter of a grade point of the cumulative grade point average of the native group. All groups, including the aggregate native group, performed at slightly below the B level.

University of Arizona

Table 5.4 reports the academic performance of the three groups at the University of Arizona. Like the data reported for Arizona State University, the average grade point averages of the three groups at the University of Arizona demonstrate quite distinctly the transfer shock phenomenon experienced by students transferring from a community college to the university. While the native group entered the study with a 2.61 average grade point average and improved steadily to a 2.86 average, the two transfer groups entered with high 3.23 and 3.15 grade point averages respectively but dropped sharply to 2.38 and 2.50 before recovering to finish with average cumulative grade point averages in the 2.6 range. The transfer shock was most severe for the CC1 group, which dropped .85 of a grade point during the first semester after entering the university. Although both the CC1 and CC2 groups did improve steadily in their academic performance, neither reacheed the level of the native group's average academic performance. The final difference between the transfer and native groups was about a quarter of a grade point, about the same difference that was found at Arizona State University, and both transfer groups performed at approximately the same level, unlike Arizona State University where the CC2 group generally outperformed the CC1 group. These aggregate data are displayed graphically in Appendix C.

Table 5.4 also details the effect of grouping the students for the native, CC1 and CC2 groups by their ranks in their high school graduating classes. As would be expected, all three of the study groups composed of only those members in the top 50 percent of their high school classes earned higher average grade point averages; those groups composed of only those members in the top 20 percent of their high school classes performed even better. Nonetheless, the phenomenon of transfer shock persisted for all groups of community college students. However, controlling for the variable of high school rank did have the effect of leveling out the long term differences between the native group and the transfer groups. This leveling effect was particularly evident for the CC2 groups, which, after an initial decline in grade point average during the first semester, rebounded and achieved grade point averages nearly equivalent to those of the native groups. The final difference between the CC2 and native groups composed of students who had graduated in the top 50 percent of their classes was less than one tenth of a grade point. The final difference for the groups composed of the upper 20 percent of their classes was only .04 of a grade point.

Table 5.5 details the academic performance of the three groups disaggregated by university college of the University of Arizona. As before, the only two colleges in which a sufficient number of students from all three groups were enrolled to warrant examination of the trend

Table 5.4

PERFORMANCE

Cumulative Grade Point Averages at U of A: Aggregate and by High School Rank

	Aggregate			Top 50%			Top 20%		
	Nat	CC1	CC2	Nat	CC1	CC2	Nat	CC1	CC2
Entry	2.69	3.23	3.15	2.75	3.29	3.25	2.94	3.44	3.32
1st Semester	2.77	2.38	2.50	2.84	2.64	2.71	3.01	2.75	2.93
2nd Semester	2.84	2.50	2.61	2.89	2.66	2.81	3.05	2.71	2.96
3rd Semester	2.84	2.56	2.63	2.89	2.68	2.84	3.06	2.80	3.01
4th Semester	2.87	2.63		2.92	2.78		3.07	2.89	
5th Semester	2.86	2.62		2.91	2.74		3.05	2.90	
Number	2,093	130	182	1,648	76	103	920	33	37

Table 5.5

PERFORMANCE

Cumulative Grade Point Averages at U of A: By University College

	Business			Liberal Arts			Engineering			Fine Arts		
	Nat	CC1	CC2	Nat	CC1	CC2	Nat	CC1	CC2	Nat	CC1	CC2
Entry	2.53	3.15	3.04	2.75	3.29	3.08	2.59			2.75		
1st Semester	2.64	2.10	2.14	2.86	2.45	2.48	2.54			2.80		
2nd Semester	2.63	2.28	2.21	2.90	2.57	2.61	2.67			2.85		
3rd Semester	2.59	2.32	2.38	2.94	2.65	2.62	2.65			2.85		
4th Semester	2.60	2.43		2.99	2.77		2.71			2.87		
5th Semester	2.61	2.53		3.01	2.82		2.68			2.86		
Number	387	17	41	895	67	62	160	7[a]	3[a]	187	8[a]	14[a]

[a]Number in group insufficient to report meaningful results.

data were the Colleges of Business and Public Administration and Liberal Arts. The initial drop in grade point averages was apparent for the two transfer groups in both colleges, though the more drastic declines were again observed in the College of Business and Public Administration. The CC1 groups exhibited higher entry grade point averages than the CC2 groups, but also suffered the greatest declines. The two transfer groups performed at roughly equivalent levels, but both groups earned average cumulative grade point averages that were .20 to .25 grade points lower than those earned by the native students.

Although Table 5.6 reports the average grade point averages of the two transfer groups disaggregated by the community colleges from which students transferred, only Pima Community College contributed significant numbers of transfers to both the CC1 and CC2 groups. The transfer students sent by Pima Community College exhibited the largest first semester declines yet recorded for any group in the study. While the limited data for the other three colleges detailed in Table 5.6 demonstrated the same trends of sharp declines from entry level grade point averages and sharper declines for the CC1 groups than for the CC2 groups, none exhibited these trends more dramatically than Pima Community College whose CC1 transfers declined a full 1.1 grade points in their first university semester. The final cumulative averages achieved by transfers from Pima were improvements over their first semester performance, but these were still well below the final cumulative averages earned by the aggregate transfer groups at both the University of Arizona and Arizona State University.

Northern Arizona University

Table 5.7 details the average grade point averages of the aggregate native, CC1 and CC2 groups at Northern Arizona University. The data demonstrate the patterns that have previously been noted at the other universities in this study. The two transfer groups entered the study with cumulative grade point averages higher than that for the native group. They then experienced transfer shock, and the grade point averages of both groups declined during the first semester at the university. The native group's cumulative grade point average began its gradual increase during the first semester of the study.

The initial decline in performance of the transfer groups was readily apparent, but the magnitude of the decline was rather small, especially when compared to the declines experienced by transfers to Arizona State University and the University of Arizona. The CC1 group declined .47 of a grade point during the first semester; the CC2 group declined .29 of a grade point. Both groups recovered during the second semester, with their cumulative grade point averages continuing to rise each subsequent semester. Eventually, the cumulative grade point averages of the transfer groups equaled or exceeded the cumulative grade point average of the native university group. The CC2 group consistently outperformed both of the other groups; it entered the study with a higher grade point average and maintained a higher grade point average than either of the other groups throughout the study.

Table 5.6

PERFORMANCE

Cumulative Grade Point Averages at U of A: By College of Transfer

	Aggregate	Pima CC		Cochise CC		Glendale CC		Phoenix CC	
	Nat	CC1	CC2	CC1	CC2	CC1	CC2	CC1	CC2
Entry	2.69	3.34	3.19		3.02	3.11	3.22	3.07	2.93
1st Semester	2.77	2.24	2.40		2.33	2.54	2.85	2.37	2.61
2nd Semester	2.84	2.37	2.49		2.78	2.68	2.72	2.50	2.59
3rd Semester	2.84	2.49	2.58		2.36	2.72	2.81	2.64	2.60
4th Semester	2.87	2.49				2.97		2.67	
5th Semester	2.86	2.46				2.92		2.69	
Number	2093	46	82	9[a]	19	15	17	14	17

[a]Number in group insufficient to report meaningful results.

Table 5.7

PERFORMANCE

Cumulative Grade Point Averages at NAU: Aggregate

	Aggregate		
	Nat	CC1	CC2
Entry	2.35	2.69	3.05
1st Semester	2.49	2.22	2.76
2nd Semester	2.59	2.37	2.79
3rd Semester	2.63	2.49	2.81
4th Semester	2.64	2.53	
5th Semester	2.67	2.61	
Number	101	27	19

The small numbers of students in the two transfer groups at Northern Arizona University make it difficult to infer too much from the data on the academic performance of the three study groups. However, the data do appear to confirm the pattern that community college transfers suffer some transfer shock upon entry to a four-year institution but recover from the effects of the shock and steadily raise their grade point averages until they are comparable to the grade point averages of native university students at similar points in their academic careers.

Grade point averages for the three groups disaggregated by university college and college of transfer were not calculated at Northern Arizona University.

6. Progress and Degree Achievement

Two separate but related measures of progress and degree achievement were used in the study. Academic progress toward a degree was measured by the average cumulative number of credit hours earned by each group after entry into the study. These average cumulative credit hours are reported by the ordinal semester after entry into the study in the same manner that average cumulative grade point averages were reported in the section on performance. This method permits direct comparisons among groups of semester-by-semester progress toward a degree. The method of reporting also makes possible comparisons of the average number of credit hours earned per semester by each of the three groups.

The average number of credit hours earned prior to entry into the study is also reported for each group. Thus the cumulative number of credit hours earned toward graduation can be calculated for each group by adding the number of credit hours earned prior to entry into the study to the cumulative hours earned in succeeding semesters.

Average cumulative credit hours earned are reported for five semesters for the native and CC1 groups, and for three semesters for the CC2 group. The reason for this limitation was discussed in the introduction to the section on performance; after these semesters for the three groups, average cumulative credit hours earned drop sharply due to the loss of the students making the most substantial progress toward graduation during the equivalent of four academic years. As was the case in the reporting of average cumulative grade point averages, use of 21st day student record tapes involved the loss of data for the spring semester, 1980. Since the number of credit hours earned by each student as of the 21st day of any semester was actually the number of hours earned through the end of the previous semester, data on students' progress at the end of spring, 1980 will not be available until the 21st day of the fall semester, 1980.

The measure of degree achievement used in this study was graduation rate. Definitions for graduation have been previously noted. Although it was necessary to use two different definitions in order to accommodate the loss of students from 21st day tapes by graduation, both definitions depended upon the accumulation of credit hours toward a degree. In both cases, graduation was defined as the accumulation of 124 or more credit hours. In order to allow direct comparisons among groups with very different numbers of members, absolute numbers of graduates in each group have been converted into percentages of the original group having graduated during any semester in the study. Thus graduation rate is the measure of degree achievement reported in this study.

The problem of "impossibly early" graduation has been thoroughly discussed in a previous section. In summary, no students were reported as having graduated before the end of the fall semester, 1978, approximately three and a half years after entry into one of the universities or colleges included in the study. Since graduates are not noted as

graduates until the semester after they actually accumulate the required number of credit hours, the number who graduated by the end of the spring semester, 1980 are not reported. The three semesters for which graduates are reported represent three and a half, four, and four and a half years after the students' hypothetical entry into an institution of higher education in the fall of 1975.

Arizona State University

Tables 6.1.a and 6.1.b detail the progress and degree achievement of the three study groups at Arizona State University. Table 6.1.a reports the average cumulative credit hours that each group earned toward a degree at the university after entry into the study, as well as the average number of credit hours earned prior to entry into the study.

The CC2 group entered the study with nearly twice as many credit hours as either of the other two groups because they had completed two years in a community college while the native and CC1 groups entered in the fall of 1976 after only one year of previous study. All three groups earned approximately equivalent numbers of credit hours per semester prior to entry into the study.

After entry into the study, the transfers earned more credit hours on the average than the natives during their first two semesters at the university. This trend was particularly pronounced for CC1 transfers who earned considerably more credit hours than the other groups during their first semester at the university. However, the number of credit hours earned per semester by the CC1 transfers declined sharply after the first one or two semesters until it was considerably less than the number earned by the natives and CC2 transfers. The CC2 group progressed at about the same rate as the native group, starting off a bit faster but slowing down to a rate just under the native group.

Table 6.1.b indicates the percentage of students of the original groups that had accumulated enough credit hours to graduate during the last three semesters of the study. All three groups graduated a few of their members at the end of the fall semester, 1978, approximately three and a half years after entry into institutions of higher education. After that, however, native and CC2 groups graduated at rates well above that of the CC1 group. By fall, 1979, 46.9 percent of the native group and 40.7 percent of the CC2 group had graduated, while only 17.0 percent of the CC1 group had graduated.

Tables 6.1.a and 6.1.b together indicate that although students who transferred to Arizona State University after a year of academic credit from an Arizona community college earned more credit hours per semester than their native counterparts for the first two semesters at the university, they earned fewer credit hours per semester than the natives by the third semester and eventually graduated less than half as many of their number on a percentage basis. Those community college transfers who had earned the equivalent of two academic years of credit at a

Table 6.1.a

PROGRESS

Average Cumulative Hours Earned at ASU: Aggregate and by High School Rank

	Aggregate			Top 50%			Top 20%		
	Nat	CC1	CC2	Nat	CC1	CC2	Nat	CC1	CC2
Hours at Entry	29.5	29.8	60.8	29.6	29.0	61.3	30.1		62.3
1st Semester	13.9	16.6	14.5	13.9	16.7	14.0	14.3		14.7
2nd Semester	28.0	29.9	28.2	28.5	29.5	28.5	29.3		29.6
3rd Semester	40.1	36.7	38.5	40.7	34.5	39.7	42.0		40.0
4th Semester	54.3	49.4		54.8	50.3		56.2		
5th Semester	68.8	58.5		69.4	57.6		70.3		
Number	1517	147	1022	1256	30	249	707	10[a]	109

[a]Number in group insufficient to report meaningful results.

Table 6.1.b

DEGREE ACHIEVEMENT

Graduation Rates at ASU: Aggregate and by High School Rank

	Aggregate			Top 50%			Top 20%		
	Nat	CC1	CC2	Nat	CC1	CC2	Nat	CC1	CC2
Number at Entry	1517	147	1022	1256	30	249	707	10[a]	109
Spring 78	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Fall 78	3.0	2.7	4.9	3.2	6.7	4.0	4.8		5.5
Spring 79	31.4	10.2	25.9	33.6	16.7	30.1	40.9		35.8
Fall 79	46.9	17.0	40.7	50.2	27.7	50.6	56.9		54.1

[a]Number insufficient to report meaningful results.

community college earned credit hours toward a degree and graduated at rates comparable to the native group, but about six percentage points lower.

The data contained in Tables 6.1.a and 6.1.b also indicate that the differences among the groups tended to be leveled when corrections for high school rank were made. This was particularly true for the differences between the native and CC2 groups in both progress and degree achievement. Through three semesters, CC2 transfers earned the same number of credit hours toward graduation on the average as natives, and their graduation rates were nearly identical to the natives when only those in the top 50 percent of their high school classes were included, and within 2.5 percentage points when only those in the top 20 percent of their classes were included. Controlling for high school rank appears to have leveled some of the differences observed between the CC1 transfers and the natives, but the data on high school rank was limited for the CC1 group and this prohibits drawing any further conclusions.

Tables 6.2.a and 6.2.b detail the progress and degree achievements of the same groups of students at Arizona State University disaggregated by university college. The pattern found for the aggregate data is essentially repeated for the four major receiving university colleges at Arizona State University. The native and CC2 groups progressed at comparable rates, earning just about the same number of credit hours per semester after entry into the study. The only exceptions appear to be in the College of Engineering, where the CC2 transfers initially earned more credit hours per semester than the natives but fell behind the natives by the third semester, and in the College of Fine Arts where natives progressed at a faster rate by the third semester. The CC1 transfers again began their university careers ambitiously, earning more credit hours for the first semester or two, but then fell well behind both groups by the third or fourth semester. The College of Business provides the clearest example of this trend; the CC1 group initially accumulated more semester hours per semester than the native group, 21.6 credit hours to 13.7 credit hours in the first semester. However, by the fifth semester, the natives had earned 71.1 credit hours to the CC1's 60.1. The rates at which the three groups accumulated credit hours were most comparable among all three groups in the College of Liberal Arts.

The graduation rates for the three groups disaggregated by university college tends to confirm the overall patterns detailed in Table 6.1.b. Nearly twice as many of the native group graduated by the end of the fall semester, 1979 than of the CC1 group in the two colleges for which comparisons were available. Graduation rates of the CC2 group were most comparable to those of the native group in the College of Business Administration, 43.8 percent to 45.6 percent respectively, and to a lesser extent in the College of Liberal Arts. In the Colleges of Engineering and Fine Arts, the native group graduated at considerably higher rates than their CC2 counterparts, and the natives' graduation rate of 55.7 by fall, 1979 in the College of Engineering was the highest yet observed.

Table 6.2.a

PROGRESS

Average Cumulative Hours Earned at ASU: By University College

	Business			Liberal Arts			Engineering			Fine Arts		
	Nat	CC1	CC2	Nat	CC1	CC2	Nat	CC1	CC2	Nat	CC1	CC2
Hours at Entry	29.0	29.4	61.6	29.4	29.6	59.9	30.1		60.1	29.8		60.8
1st Semester	13.7	21.6	14.5	13.7	13.7	13.4	13.8		17.5	14.9		13.5
2nd Semester	28.0	37.6	28.7	27.7	27.2	27.8	29.0		29.8	28.0		27.0
3rd Semester	40.2	43.6	39.0	39.2	35.1	38.2	41.3		38.3	42.8		37.7
4th Semester	56.2	48.9		53.4	51.5		56.1			53.9		
5th Semester	71.1	60.1		67.6	60.6		70.1			70.1		
Number	318	30	249	762	82		192	16[a]	95	170	11[a]	65

[a]Number in group insufficient to report meaningful results.

Table 6.2.b

DEGREE ACHIEVEMENT

Graduation Rates at ASU: By University College

	Business			Liberal Arts			Engineering			Fine Arts		
	Nat	CC1	CC2	Nat	CC1	CC2	Nat	CC1	CC2	Nat	CC1	CC2
Number at Entry	318	30	249	762	82	401	192	16[a]	95	170	11[a]	65
Spring 78	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Fall 78	1.9	0.0	4.8	3.4	4.9	4.5	4.2		3.2	2.4		1.5
Spring 79	32.7	6.7	25.3	30.4	14.6	24.9	31.8		22.1	31.2		12.3
Fall 79	45.6	23.3	43.8	44.4	24.4	37.2	55.7		41.1	48.2		32.3

[a]Number in group insufficient to report meaningful results.

Table 6.3.a indicates the progress toward graduation made by transfers at Arizona State University by the community college from which they transferred. The average progress of the native group is also noted for purposes of comparison. Transfers from all four of the major contributing community colleges were successful in transferring about the same number of credit hours to the university prior to entry into the study. Similarly, all of the transfer groups began the study with about the same number of hours earned per semester as the native group.

The tendency for CC1 transfers to earn credit hours initially at a faster rate and then to fall behind the other two groups was evident for Glendale, Mesa and Scottsdale Community Colleges. The CC1 transfers from Phoenix progressed rapidly until the fourth semester when they fell behind the native group. CC1 transfers from Phoenix and Scottsdale appeared most vulnerable to the fast start but poor finish syndrome; CC1 transfers from these two colleges earned the greatest number of credit hours by the end of the first semester at the university and the fewest by the end of the fifth semester. However, CC1 transfers from Mesa Community College were the exception, progressing toward graduation at a rate quite comparable to the university native group.

Data on graduation rates contained in Table 6.3.b disaggregated by college of transfer confirm previously noted trends. CC2 transfers graduated at nearly twice the rate as CC1 transfers, and at Phoenix Community College, CC2's graduated at three times the rate of CC1 transfers. In all cases the graduation rate for the native university group was higher than the rates for the CC1 transfers, usually considerably higher. However, students who transferred from a community college after two academic years graduated at rates much more comparable to those who entered the university as freshmen. The graduation rates for CC2 transfers from Phoenix, Mesa and, to a lesser extent, Scottsdale Community Colleges, were reasonably comparable to the 46.9 percent graduation rate for native students. However, the 50.4 percent graduation rate for CC2 transfers from Glendale Community College was well above the graduation rate established by native Arizona State University students.

University of Arizona

Tables 6.4.a and 6.4.b report the academic progress and degree achievement of the three groups at the University of Arizona. Table 6.4.a details the average cumulative credit hours earned by each group toward graduation.

Both native and CC1 groups earned equivalent numbers of credit hours at their respective institutions prior to entry into the study. The CC2 group, of course, earned approximately twice as many credit hours at the community college as the CC1 group. The tendency was for native and CC2 groups to accumulate credit hours and to progress toward graduation at virtually identical rates. However, the CC1 group progressed at a rate considerably below the other two groups.

Table 6.3.a

PROGRESS

Average Cumulative Hours Earned at ASU: By College of Transfer

	Aggregate	Glendale CC		Mesa CC		Phoenix CC		Scottsdale CC	
	Nat	CC1	CC2	CC1	CC2	CC1	CC2	CC1	CC2
Hours at Entry	29.5	29.6	61.2	30.4	60.5	29.4	61.3	29.2	60.4
1st Semester	13.9	14.2	14.5	14.6	14.0	18.7	15.9	19.0	13.8
2nd Semester	28.0	25.4	29.2	25.7	28.8	32.7	28.1	35.2	27.1
3rd Semester	40.1	30.6	39.8	36.2	38.7	40.0	38.0	36.9	38.1
4th Semester	54.3	38.4		53.6		50.4		55.1	
5th Semester	68.8	57.0		65.4		55.9		55.8	
Number	1,517	22	256	39	298	47	225	23	125

Table 6.3.b

DEGREE ACHIEVEMENT

Graduation Rates at ASU: By College of Transfer

	Aggregate	Glendale CC		Mesa CC		Phoenix CC		Scottsdale CC	
	Nat	CC1	CC2	CC1	CC2	CC1	CC1	CC1	CC2
Number at Entry	1,517	22	256	39	298	47	225	23	125
Spring 78	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fall 78	3.0	0.0	5.5	2.6	5.0	4.3	6.2	4.3	2.4
Spring 79	31.4	13.6	32.8	15.4	23.2	10.6	26.2	4.3	24.0
Fall 79	46.9	27.3	50.4	17.9	37.9	12.8	40.4	21.7	36.0

Table 6.4.a

PROGRESS

Average Cumulative Hours Earned at U of A: Aggregate and by High School Rank

	Aggregate			Top 50%			Top 20%		
	Nat	CC1	CC2	Nat	CC1	CC2	Nat	CC1	CC2
Hours at Entry	29.8	28.7	57.6	29.9	29.5	59.2	30.5	28.9	60.7
1st Semester	13.3	10.9	13.0	13.6	11.8	14.0	14.2	12.7	14.1
2nd Semester	28.2	24.4	28.8	28.7	25.2	29.1	29.7	25.8	31.2
3rd Semester	41.1	36.3	40.8	42.2	38.5	41.8	43.8	41.0	45.1
4th Semester	56.8	49.0		57.8	54.9		59.6	58.6	
5th Semester	69.9	63.0		71.0	66.8		72.8	73.7	
Number	2093	130	182	1648	76	103	920	33	37

Table 6.4.b

DEGREE ACHIEVEMENT

Graduation Rates at U of A: Aggregate and by High School Rank

	Aggregate			Top 50%			Top 20%		
	Nat	CC1	CC2	Nat	CC1	CC2	Nat	CC1	CC2
Number at Entry	2093	130	182	1648	76	103	920	33	37
Spring 78	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fall 78	4.7	1.5	2.8	5.2	2.6	2.9	7.1	3.0	5.4
Spring 79	32.6	13.1	28.0	36.0	18.4	32.0	44.7	30.3	46.0
Fall 79	43.9	30.8	41.8	48.1	40.8	45.6	57.4	57.6	62.2

At the University of Arizona, the CC1 group entered the study with fewer credit hours and earned fewer credit hours toward graduation from the first semester onward than did the other two groups. This was different from the experience of the comparable group at Arizona State.

Table 6.4.b details the graduation rates for the three groups. The native and CC2 groups graduated similar percentages of their number three and a half, four, and four and a half years after the fall of 1975. The percentage of graduates of the native group was slightly higher than the corresponding percentages for CC2 graduates. The CC1 transfers, however, continued their slower progress toward graduation and graduated a significantly lower percentage of their original group during the same time periods as was true at ASU.

Tables 6.4.a and 6.4.b indicate the effect of controlling for the ranks of students in their high school classes on the progress and degree achievement of the groups. Considering only those of each group who had graduated in the top 50 percent of their high school classes, the CC1 transfers gained some ground on the two groups but still progressed at a slower rate overall. The progress of native students and CC2 students who graduated in the upper halves of their high school classes were virtually identical. Considering only those in the top 20 percent of their high school classes, the CC1 transfers progressed at the same rate as the natives, earning 73.7 credit hours by the fifth semester to 72.8 credit hours for the native group. The CC2 group actually progressed at a faster rate than the native group when only those in the top 20 percent of their high school classes were considered.

Controlling for high school rank had a similar effect on the graduation rates of the three groups. When only those students in the top 50 percent of their classes were included in the study groups, some differences remained in the graduation rates. However, when only those in the top 20 percent were considered, the overall graduation rates for all three groups were quite similar. In fact, the CC2 group had a higher percentage of graduates by the fall of 1979, though it had only graduated 30.3 percent by the end of the spring semester, 1979, four years after the fall of 1975.

Controlling for the high school ranks of the students in the three groups, then, had the effect of leveling or erasing differences. This result was found for measures of persistence, performance, progress and degree achievement at both the University of Arizona and at Arizona State University.

Tables 6.5.a and 6.5.b detail the progress and degree achievement of the same groups of students disaggregated by university college at the University of Arizona. The same trends noted for the aggregate groups applied to those groups broken down according to enrollment in the two largest university colleges at the Univeristy of Arizona, the Colleges of Business and Public Administration and Liberal Arts.

Table 6.5.a

PROGRESS

Average Cumulative Hours Earned at U of A: By University College

	Business			Liberal Arts			Engineering			Fine Arts		
	Nat	CC1	CC2	Nat	CC1	CC2	Nat	CC1	CC2	Nat	CC1	CC2
Hours at Entry	29.5	29.2	56.2	29.8	29.0	56.4	30.4			29.4		
1st Semester	13.0	11.7	13.7	13.2	10.7	11.6	12.2			12.3		
2nd Semester	26.8	26.7	28.5	27.9	24.6	26.1	27.9			26.9		
3rd Semester	39.2	36.2	41.1	40.1	36.4	39.7	39.9			40.6		
4th Semester	54.0	45.8		55.0	49.0		56.7			55.6		
5th Semester	67.1	61.5		68.3	62.6		69.1			69.9		
Number	387	17	41	895	67	62	160	7[a]	3[a]	187	8[a]	14[a]

[a]Numbers in group insufficient to report meaningful results.

Table 6.5.b

DEGREE ACHIEVEMENT

Graduation Rates at U of A: By University College[b]

	Business			Liberal Arts			Engineering			Fine Arts		
	Nat	CC1	CC2	Nat	CC1	CC2	Nat	CC1	CC2	Nat	CC1	CC2
Number at Entry	387	17	41	895	67	62	160			187		
Spring 78	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0		
Fall 78	2.1	0.0	0.0	2.2	0.0	0.0	5.7			2.1		
Spring 79	27.2	15.0	15.0	26.4	6.0	29.3	35.2			28.3		
Fall 79	40.7	23.8	37.5	33.4	20.0	33.3	52.1	7[a]	3[a]	36.8	8[a]	14[a]

[a]Number in group insufficient to report meaningful results.

[b]Graduation rates are for these cohorts only. Method of calculating graduation rates and selection criteria prohibit inferences concerning graduation rates for these colleges as a whole.

Natives and CC2 transfers progressed at about the same rate in both colleges, though the CC2 transfers appeared to have a slight edge on native students in the College of Business and Public Administration in the terms of the number of credits earned in the first three semesters of the study. The CC1 group lagged behind the natives and CC2's in credit hours earned in both university colleges from the first semester onward. The CC1 transfers also graduated a smaller percentage of their number than the other two groups in both colleges.

The native university students had an edge over the CC2 transfers in the percentage of their group graduating by the fall, 1979 in the College of Business and Public Administration, 40.7 percent to 37.5 percent. In the College of Liberal Arts, the difference was insignificant; both groups graduated at essentially the same overall rate. Of more interest is the fact that the graduation rates for all three groups in the College of Business and Public Administration were higher than the corresponding rates for the same groups in the College of Liberal Arts.

Table 6.6.a reports the progress of the community college transfers at the University of Arizona as measured by average cumulative credit hours earned disaggregated by the college from which these students transferred. Although the groups representing Cochise, Glendale and Phoenix Colleges were dangerously small for describing conclusions or trends, the data contained in Table 6.6.a indicate that transfers from Pima Community College compared least favorably to the native university group in progress toward graduation as measured by cumulative credit hours earned at the University of Arizona. The CC2 group from Pima Community College compared reasonably well to the native group, but the CC1 group from Pima Community College progressed at a significantly lower rate than the native university students as well as all other CC1 transfers shown in Table 6.6.a. Again, the CC2 transfers progressed at consistently higher rates toward graduation than their CC1 counterparts, but both groups from Glendale Community College accumulated credit hours toward graduation at similar rates which exceeded those of the university native comparison group.

Similarly, the percentage of transfers who graduated by fall 1979 as reported in Table 6.6.b indicate that CC1 transfers graduated at lower rates than both native students and CC2 transfers for three of the four community colleges listed. Again, Pima Community College transfers compared least favorably in terms of the percentage of their number who graduated by fall, 1979. Three of the four transfer groups from Glendale and Phoenix Colleges actually graduated at rates that exceeded the rates for native University of Arizona students. However, the small numbers in these groups makes conclusions based upon these observations tenuous at best.

Northern Arizona University

Table 6.7.a details the progress of the three groups included in the study at Northern Arizona University. The native and CC1 transfer groups

Table 6.6.a

PROGRESS

Average Cumulative Hours Earned at U of A: By College of Transfer

	Aggregate	Pima CC		Cochise CC		Glendale CC		Phoenix CC	
	Nat	CC1	CC2	CC1	CC2	CC1	CC2	CC1	CC2
Hours at Entry	29.8	27.2	56.5		56.8	28.9	58.1	28.1	56.8
1st Semester	13.3	9.1	12.9		15.3	13.5	13.8	11.4	10.3
2nd Semester	28.2	21.5	27.1		32.1	29.0	28.6	25.3	26.5
3rd Semester	41.1	32.5	38.8		36.0	43.2	44.5	38.5	39.5
4th Semester	56.8	41.8				59.5		52.6	
5th Semester	69.9	55.3				72.7		65.0	
Number	2093	46	82	9[a]	19	15	17	14	17

[a]Number in group insufficient to report meaningful results.

Table 6.6.b

DEGREE ACHIEVEMENT

Graduation Rates at U of A: By College of Transfer

	Aggregate	Pima CC		Cochise CC		Glendale CC		Phoenix CC	
	Nat	CC1	CC2	CC1	CC2	CC1	CC2	CC1	CC2
Number at Entry	2093	46	82	9[a]	19	15	17	14	17
Spring 78	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Fall 78	4.7	0.0	1.2		10.5	6.7	5.9	0.0	0.0
Spring 79	32.6	6.5	22.0		36.8	13.3	41.2	14.3	23.5
Fall 79	43.9	17.4	35.4		42.1	33.3	52.9	57.1	47.1

[a]Number in group insufficient to report meaningful results.

Table 6.7.a

PROGRESS

Average Cumulative Hours Earned at NAU:
Aggregate

	Aggregate		
	Nat	CC1	CC2
Hours at Entry	29.1	28.8	59.4
1st Semester	12.0	18.8	15.2
2nd Semester	24.7	28.7	30.0
3rd Semester	39.4	40.2	45.8
4th Semester	54.6	53.2	
5th Semester	69.7	67.0	
Number	101	27	19

entered the study with approximately the same number of accumulated credit hours. The CC2 transfer group entered a year later with slightly more than twice the number of credit hours of the other two entry groups at time of entry. At NAU, the transfer groups progressed more rapidly than the native group, earning 13.8 and 15.2 credit hours during the first semester, as compared to the 12.0 credit hours earned by the native group. The CC2 group maintained its lead over the native group in accumulating credit hours, but by the fourth semester of the study, the native group had passed the CC1 transfers. The pattern noticed at the other universities for CC2 transfers to earn more credit hours per semester after entry into the study than their CC1 counterparts held at Northern Arizona University, but the two transfer groups at NAU consistently progressed as rapidly or more rapidly than the native group. At neither of the other two universities did the CC1 group progress at a rate comparable to the native group.

The graduation rates for the three groups at Northern Arizona University are reported in Table 6.7.b. These rates are surprising in that they reverse the trends found in the graduation rates of aggregate groups at the other two universities. The two transfer groups graduated considerably higher percentages of their number than the native group. Forty-eight percent of the CC1 group graduated by the fall of 1979, and 26.3 percent of the CC2 group graduated by that time; only 14.9 percent of the native group had been identified as having graduated by the fall of 1979.

At Northern Arizona University, two samples of community college transfers were found to outperform a sample of native university students on measures of persistence, academic performance, academic progress and degree achievement. These are provocative trends especially in that they differ from trends found at both Arizona State University and the University of Arizona. The small numbers included in the transfer groups and the fact that all three groups are samples--and thus subject to sampling errors--require considerable caution in interpreting these results even though they were produced by methods similar to those used at the other two universities.

Measure of academic progress and graduation rates disaggregated by university college and college of transfer were not calculated at Northern Arizona University.

Table 6.7.b

DEGREE ACHIEVEMENT

Graduation Rates at NAU:
Aggregate

	Aggregate		
	Nat	CC1	CC2
Number at Entry	101	27	19
Spring 78	0.0	0.0	0.0
Fall 78	4.0	11.1	0.0
Spring 79	6.9	37.0	10.5
Fall 79	14.9	48.1	26.3

7. Recommendations for Future Studies

This study has demonstrated that relevant information, useful both to community colleges and universities, can be generated at relatively low cost through cooperation of the public institutions of the state. The results of this initial study can provide baseline data against which the performance of future student generations can be assessed. In order to make future studies as inexpensive and productive as possible, the experiences of those conducting this study suggest the following recommendations:

1. The current study indicates that students who transfer after completing two years at a community college do almost as well as native students and compare favorably with the results reported for community college transfer students in other states. Students who transfer after one year at a community college do significantly less well. Universities should study those who transfer with less than two years including two groups not considered in the present study: (1) Those who earn 9-23 credit hours before transfer and (2) those who earn 37-47 credit hours before transfer. The study groups should be disaggregated into those who were eligible to attend a university upon graduation from high school and those who were not. If the strong relationship between number of hours completed before transfer and performance at the university in relation to rank in high school graduating class is the same as found in this study, universities should consider establishing successful completion of the equivalent of two years at a community college as a requirement for entry to a university for those ineligible to attend at the time they completed high school.

2. The three State Universities should routinely collect as a part of the admissions process and subsequently record in their student information systems the data necessary to conduct follow-up studies without extensive manual effort. As a minimum such data should include rank in high school graduating class for all students admitted (both transfer and initial entry), ethnic origin (self-reported seems adequate if some effort is made to encourage applicants to complete this information request) and number of hours earned and cumulative grade point average at the institution from which transfer occurs. This list could easily be expanded but these were the data elements where the greatest inconsistencies occurred among universities and where the most effort was involved in reconstructing missing data.

3. The format for future follow-up studies should be standardized through discussions among appropriate staff from the

three universities as soon as possible. The exchange of computer programs already begun can aid in bringing all three universities to a common readiness to engage in this type of analysis. In establishing a standard format, consideration should be given to the use of "end-of-the-semester" student record tapes as opposed to the "21-day" student record tapes that had to be used in this study. Use of "end-of-semester" tapes would eliminate many of the problems encountered relative to definitions of graduation, backdating of grade point averages and credit hours earned, and disparities in number of students enrolled at the beginning of a semester and those reporting grades at the end. The end-of-semester tapes could easily be made available to the institutional research offices of the universities.

4. Colleges within the universities should consider conducting internal follow-up studies to determine the characteristics of students who succeed in their programs as well as the types of assistance that might contribute to persistence and achievement. Community colleges should consider conducting follow-up studies to collect additional information on the experiences of those who are "successful" transfers contrasted with those who do not transfer at all or who leave the university within a semester or two after transfer.

5. Profiles of students who graduate as contrasted with those who leave could easily be compiled from data generated by the present study design. Data on academic variables such as high school rank, first semester grade point average, transf r grade point average, credit hours transferred, and credit hours earned per semester could be augmented by demographic data. A regression analysis of profiles could then be used to evaluate admission policies, advisement practices and other receiving institution policies and practices. The quantitative data could be augmented by surveys and interviews to provide additional insight about changes that could influence persistence and achievement indices.

6. The methodology developed and the data collected for this study could be used to study the persistence, performance and degree achievement of other sub-groups of students of interest to the universities including minority students, international students and athletes.

Appendix A

A Comparison of Students Transferring to the University of Arizona with Native Students in the Fall of 1977

The study design called for the comparison of three groups of students. Two of these, the native group and the CC1 group entered the study in 1976. The third group, the CC2 group, entered the study in 1977. The design thus enhanced the persistence and degree achievement rates for the CC2 group since they were studied for one year less than the other two groups and thus had less time in which to drop out.

Researchers at the University of Arizona asked the question, what would happen if a fourth comparison group was added: native students who had completed 48-64 credit hours by the fall of 1977. This fourth comparison group was labeled Native 2. The results of comparing CC2 students with Native 2 students appears in Tables A1-1 through A1-4.

The modification of the study design did not change the fundamental nature of the results of the study. As was expected, persistence rates and degree achievement rates were lower for the CC2 group than for the Native 2 group. However, the differences diminished or disappeared when the effects of rank in high school graduating class were controlled. The average cumulative hours earned showed very little difference. Cumulative grade point averages after entry were within .25 of a grade point diminishing to .18 by the third semester after entry. Differences in cumulative grade point averages disappeared when rank in high school graduating class was controlled.

The addition of a fourth comparison group confirms the basic findings of the study. When the comparisons take into consideration rank in high school graduating class, transfer students performed at levels very close to those for native students. Even when the effects of rank in high school graduating class were not considered, performance differences are marginal. As in the case of the three group design, both transfers and native students were achieving on the average a B- grade point in the last semester of the study.

Table A.1

PERSISTENCE

Retention Rates at U of A: Native 2 and CC2 Students

	Aggregate		Top 50%		Top 20%	
	Nat 2	CC2	Nat 2	CC2	Nat 2	CC2
Number at Entry	1353	182	978	103	499	37
Fall 77	100.0	100.0	100.0	100.0	100.0	100.0
Spring 78	90.8	89.6	92.4	90.3	93.4	100.0
Fall 78	81.4	72.5	84.3	73.8	88.6	89.2
Spring 79	79.5	70.3	81.6	70.9	86.2	83.8
Fall 79	72.7	61.0	75.1	63.1	79.4	78.4
Spring 80	74.8	62.1	77.2	63.1	80.4	78.4

Table A.2

PERFORMANCE

Cumulative Grade Point Averages at U of A: Native 2 and CC2 Students

	Aggregate		Top 50%		Top 20%	
	Nat 2	CC2	Nat 2	CC2	Nat 2	CC2
Entry	2.65	3.15	2.71	3.25	2.91	3.32
1st Semester	2.71	2.50	2.78	2.71	2.98	2.93
2nd Semester	2.77	2.61	2.84	2.81	2.99	2.96
3rd Semester	2.79	2.63	2.87	2.84	3.00	3.01
Number	1353	182	978	103	499	37

Table A.3

PROGRESS

Average Cumulative Hours Earned at U of A: Native 2 and CC2 Students

	Aggregate		Top 50%		Top 20%	
	Nat 2	CC2	Nat 2	CC2	Nat 2	CC2
Hours at Entry	56.8	57.6	57.1	59.2	57.7	60.7
1st Semester	12.4	13.0	13.1	14.0	13.6	14.1
2nd Semester	28.0	28.8	28.8	29.1	29.7	31.2
3rd Semester	41.1	40.8	42.6	41.8	43.7	45.1
Number	1353	182	978	103	499	37

Table A.4

DEGREE ACHIEVEMENT

Graduation Rates at U of A: Native 2 and CC2 Students

	Aggregate		Top 50%		Top 20%	
	Nat 2	CC2	Nat 2	CC2	Nat 2	CC2
Number at Entry	1353	182	978	103	499	37
Spring 78	0.0	0.0	0.0	0.0	0.0	0.0
Fall 78	1.0	2.8	1.2	2.9	1.2	5.4
Spring 79	28.6	28.0	32.8	32.0	39.3	46.0
Fall 79	46.3	41.8	51.6	45.6	60.9	62.2

Appendix B

Review of the Literature

The most comprehensive study of transfer students was conducted by Knoell and Medsker (1965). The study dealt with a core group of 7,243 junior college students who entered four-year institutions; and with comparison groups of 4,026 transfer students and 3,349 native students who graduated in 1962. Their study revealed that all or most junior college students could be successful in achieving their goals after transfer if they could select four-year institutions and major fields appropriate to their ability and prior achievement. They further concluded that the effects of diversity in higher education--in the quality of the entering students, level of instruction, types of programs, climate of learning, and pursuits of the faculty--are reflected in the findings concerning the differential performance of the transfer students. At least during the first year after transfer, grade point differentials are one of the realities of university life which transfer students should be prepared to accept, but the size of the drop and the degree of improvement afterward varies with the institution.

In 1965, Hills reviewed more than 20 studies involving community college transfer students and their subsequent performance at four-year institutions. He reported that transfer students did experience a drop in GPA during the first semester at the four-year institution and that average GPA tended to rise in each subsequent semester. Hills termed this initial decline "transfer shock." Additionally, the transfer student, Hills suggests, will be less likely to survive to graduate from the four-year institution than the native student, and, if the transfer student does survive, it will take him longer to graduate (Hills, 1965).

In preparation for their research Noland and Hall (1978) examined seventeen studies (from 1966 to 1973) to determine whether or not the earlier findings of Knoell and Medsker (1965) and Hills (1965) hold true over time. In eight of the studies, transfer shock was observed; no difference in GPA was reported in four studies. (The following overview combines the results of Nolan and Hall with more recent studies.) Nolan and Hall reported that transfers from Southern West Virginia Community College experienced transfer shock after one semester at the four-year institution. However, by the time the students had completed at least thirty additional hours, their GPA's were almost identical to those of upper divsion native students.

Statewide studies and institutional reports have examined this phenomenon--transfer shock. Smalley (1975) reported that all four groups of transfer students from six Missouri community colleges to the University of Missouri (Kansas City) had a drop in their GPA's after the first semester; greater drop was experienced by those transferring a lesser number of credits. A follow-up study (1977) of transfer students from Illinois public community colleges indicated that of the 10,145 transfer

students a) 40 percent completed an associate degree before transfer; b) mean ACT test score was 20 and mean GPA was 2.8 prior to transfer; c) at the end of one term 88 percent were still enrolled; d) two years after transfer, 22 percent had graduated, 53 percent were enrolled in good standing, 4 percent on academic probation, 2 percent dismissed and 15 percent had withdrawn; e) GPA of transfer students had declined to 2.64 at the end of the first year but had increased to 2.8 at the end of the second year. Anderson (1977) reviewed the academic progress and success of community college transfers, four-year transfers, and continuous juniors over six semesters at the University of Illinois (Urbana-Champaign). Anderson's findings indicated that although community college transfers enter with a GPA equivalent to the lower division GPA's of native students, the transfers experience more academic difficulty after transfer and have higher academic probation and drop rates than the other two groups in the study. Further, the study found that community college transfers consistently achieve lower GPA's than the other two groups in the twelve subject areas studied.

A study of 110 Pennsylvania four-year institutions reported 53 percent of the 2,000 transfers from in-state community colleges maintained their GPA within .5 after transferring; 12 percent raised their GPA by more than .5 and 35 percent lowered their GPA by more than .5 (Martinko, 1978). New Jersey community college transfer students at in-state four-year institutions maintained comparable GPA's after transfer and had earned higher mean GPA's than non-transfer or native students after the junior year (Miller, 1978). Holahan and Kelley (1978), in a study of 1,362 transfer students at a large southwestern state university, reported that transfers from public junior colleges felt themselves least able to cope with the self-assertion demands of the university. The authors also reported that these transfer students earned the lowest cumulative GPA's after the first semester of transfer.

Transfer students' academic achievement and persistence have been studied by numerous researchers. Melnick et al. (1970) contrasted three groups of students at Hofstra University (New York): Native students, four-year transfer students and community college transfers. Results of the study indicated that community college transfers had the lowest graduation rate of the three groups. In predicting performance, the authors found SAT Verbal scores of little value. Nickens (1975) found that most of the Florida community college transfer students were successful in most of the majors at all the universities. In addition, low correlations were found for GPA attained in various universities and transfer student's Florida twelfth grade test scores.

Wiggins (1974) compared the level of academic achievement of Bristol Community College students with their level of achievement on graduation from Southeastern Massachusetts University. GPA's achieved by three classes of Bristol graduates were at a level similar to that which they had achieved at Bristol. Losak and Corson (1977) reported that, in a random sample of graduates from Miami-Dade Community College, 66 percent entered Florida State University system with 45 percent earning a baccalaureate degree. Extensive statistical data from a study of

transfer students from the Florida community colleges to the Florida State University system over a three-year period indicated that the majority earned a GPA of 2.00 or better and finished upper division study or otherwise withdrew in two years (1977).

In a three-year longitudinal study of 10,504 community college transfers in Illinois, Moughamian et al. (1979) recorded that the GPA's of transfer students showed satisfactory progress. At the end of the first year, 88 percent of those whose status was reported were still enrolled in the universities; after two years, 82 percent had either graduated or were still pursuing the baccalaureate degree.

Bolte and Coleman (1979), in a study of the academic success of 730 native and 595 community college transfers to the University of Central Florida, have shown that 38 percent of the native students complete the baccalaureate program within three years and 44 percent of community college transfers graduate within five years.

Numerous studies have examined the performance and achievement of Los Angeles City College transfer students in the California State University and College system or at individual campuses (Gold, 1971; Gold 1979). Gold (1979) in a 12-year summary (1966-78) indicated that the university GPA's of the community college eligibles remained between 2.8 and 2.9 from 1970-77; GPA's of ineligibles were generally about .15 grade points lower than that of eligibles.

Thompson (1978) studied the difference between the characteristics and achievements of students who transferred from two-year institutions into the University of Arizona's College of Business and Public Administration and those students who matriculated at the University of Arizona as freshmen. The study indicated that there was no difference between the groups when comparisons are based on GPA's earned in the junior-senior year if students are matched on matching based on the basis of high school rank. When the two groups were not matched, a significant difference in achievement was found. She also showed that native students have significantly higher graduation rates than transfers within two and three years after beginning the junior year although the completion of the associate degree by community college transfers affected these completion rates. Those with the associate degree were more likely to complete the graduation requirements within two years while those without the degree took longer to obtain the baccalaureate.

The University Counseling Services of Arizona State University has investigated student attrition in a series of studies (Churchill, Baron, Cummings, Iwai and Zubia, 1976; Iwai, Churchill and Baron, 1977; Iwai and Churchill, 1978). Two studies in particular examined the withdrawal and persister rates of junior college transfer students (Iwai, Churchill and Baron, 1977; Iwai and Churchill, 1978). The former study (1977) found that the proportion of transfer students in the withdrawal group was greater than in the persister group and those transfer students in the withdrawal group had lower GPA's than high school entrants in the same group. The latter study (1978) further examined the withdrawals and

persisters of the previous study. A breakdown of these groups into four source school groups (Arizona High Schools, Out-Of-State High Schools, Arizona Junior Colleges, and Out-of-state Junior Colleges and Universities) revealed that the largest proportion of students in the Dropout and Low Stopout group came from the Arizona Junior Colleges.

An Overview of the Findings of Selected Transfer Studies

Author	State	Summary of Findings
Lee & Suslow (1966)	California	Junior college GPA is generally predictive of university GPA. Transfer shock observed.
Grieve (1967)	Ohio	Observed a GPA drop of .30 in the first semester after transfer.
Hall (1967)	California	No appreciable change in GPA of transfer students.
Pearce (1968)	California	No marked difference in GPAs.
Britton (1969)	Missouri	Observed transfer shock but no subsequent difference between native and transfer students.
Mann (1969)	Missouri	No differences in native and transfer students' GPAs.
Denison & Jones (1970)	Canada	Transfer students improved GPA after first semester.
Frankel (1970)	New York	Transfer students were as successful as natives in the senior college, except in engineering.
Gold (1971)	California	Transfer shock of minus .29 grade points observed.
Hewitt (1971)	Michigan	Native and transfer students are about equal in their ability to perform academically.
Wray & Leischuck (1971)	Alabama	Community college GPA was the best pedictor of university success.
Blielip (1973)	Maryland	Found a statewide drop in GPA of .27; however, final GPA was the same as that earned at the community college.

Author	State	Summary of Findings
Elliot (1972)	Pennsylvania	Transfer students falter most frequently during the first or second semester, then adjust rapidly to the new environment.
Nickels (1972)	Florida	Community college grades were the best predictor of success in upper division work.
Wermers (1972)	Illinois	No difference between native and transfer students on the CLEP general examination.
Reese (1973)	Maryland	Observed an average drop in GPA of .28 along with an ultimate increase in overall GPA by graduation.
Smith (1973)	New Jersey	Transfer students achieved as well a natives when they were in direct competition in a traditional classroom situation during their semester of upper division professional studies.
Hodgson & Dickinson (1974)	Washington	Community college transfers have lowest GPA among the native students and four-year transfers. However, remove aptitude level differences, and differences in GPA disappear; Community college transfers fared relatively worse than other groups in graduation rates and post-transfer grades.
Nickens (1975)	Florida	Transfer students are successful in most of the majors at all universities; low correlation between university GPA and Florida 12th grade test scores.
Wiggins (1974)	Massachusetts	GPA's of community college transfers at graduation from university are at a level similar to that at the community college.

Author	State	Summary of Findings
Smalley (1975)	Missouri	Transfers suffered transfer shock.
(No author) (1977)	Illinois	GPA declined to 2.6 at the end of the first year; maintained 2.8 at the end of the second year.
Miller et al. (1977)	New Jersey	GPA of transfers compared favorably with native students.
Losak & Corson (1977)	Florida	66% of the community college transfers entered the university system with 45% graduating.
(No author) (1977)	Florida	Majority of community college transfers earned GPA of 2.00 or better.
Thompson (1978)	Arizona	Community college transfer students performed as well as native students based on academic standing when matching based on high school rank was done. When two groups were not matched, significant differences in achievement were observed.
Anderson (1977)	Illinois	Transfers experienced academic difficulty.
Nolan & Hall (1978)	West Virginia	Transfers experienced transfer shock.
Holahan & Kelley (1978)		Transfers from community colleges earned lowest cumulative GPA's after first semester than any group of transfers.
Phlegar (1978)	Virginia	Community college GPA major predictor of four-year institution success for transfer student.
Rogers (1978)	Arkansas	Community college transfers with two full years of college before transfer one to four-year institution with higher GPA than other transfers; however, they also suffered greater GPA loss.

Author	State	Summary of Findings
Harden (1979)	Florida	Transfers may not experience transfer shock.
Moughamian et al (1979)	Illinois	GPA's of community college transfers showed satisfactory progress.
Bolte & Coleman (1979)	Florida	44% of community college transfer students graduate within five years with the baccalaureate degree.
Martinko (1979)	Pennsylvania	53% of community college transfer students maintained their GPA after the first year of transfer.

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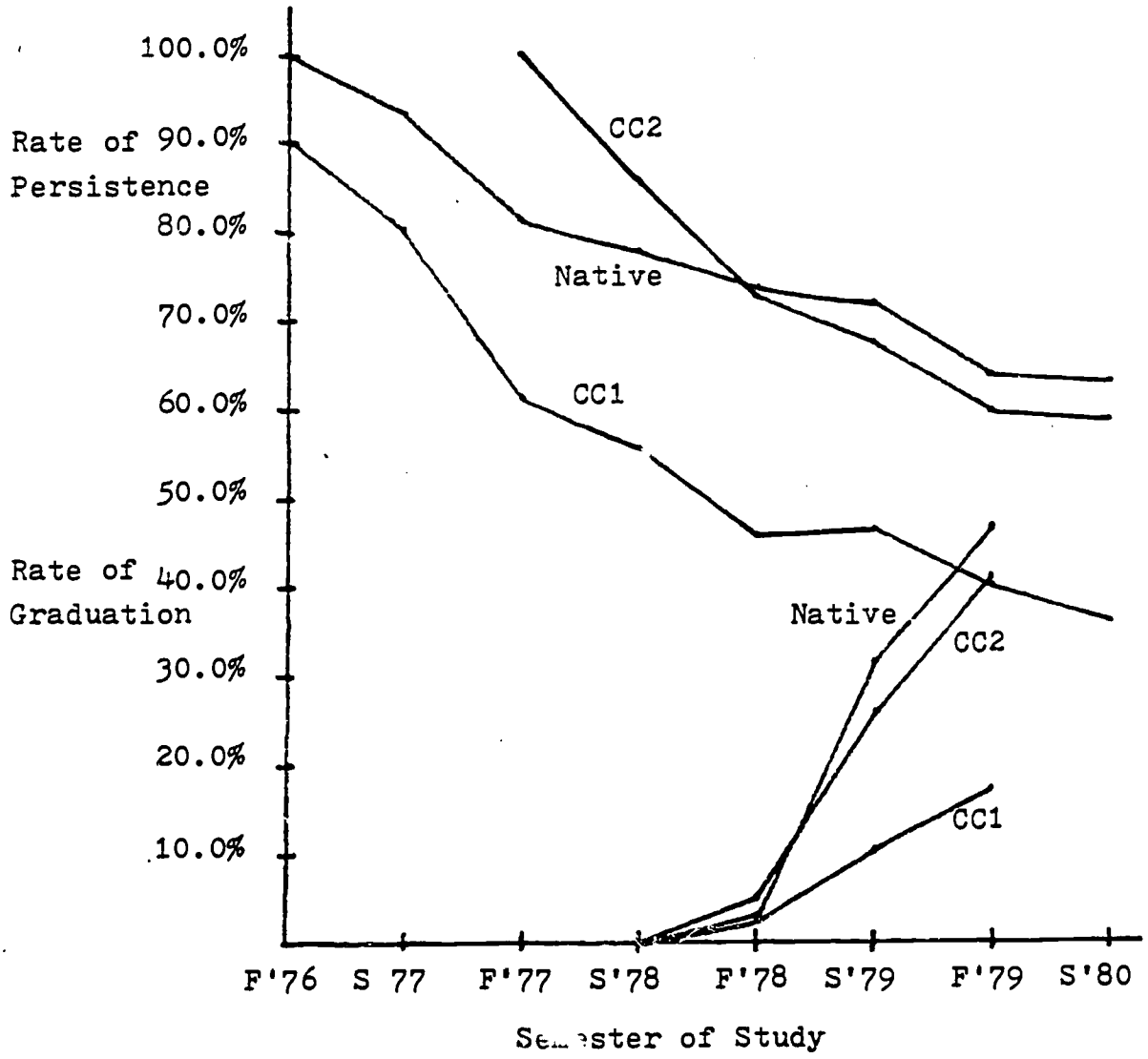
Appendix C

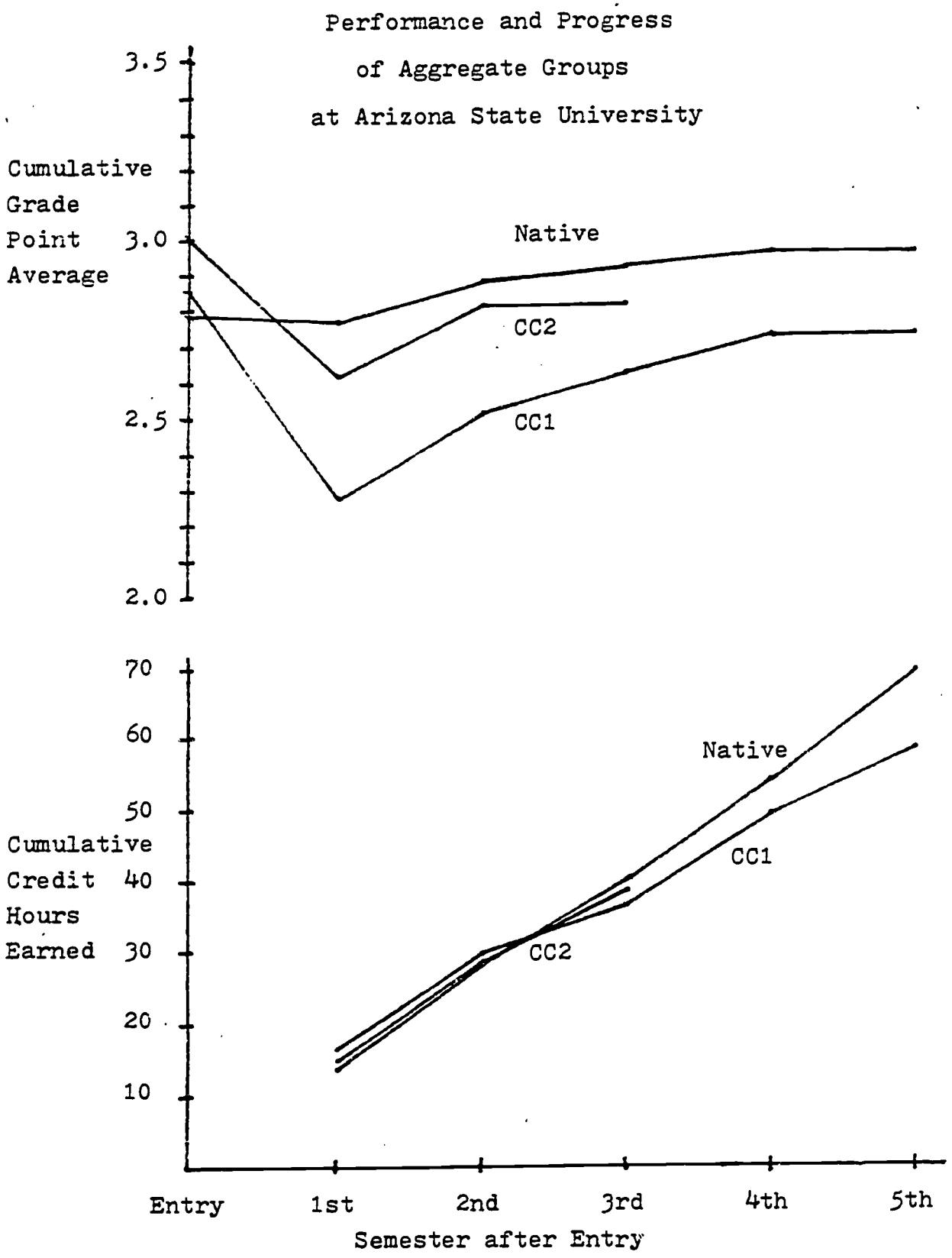
A Graphical Representation of the Results of the Study

Persistence and Graduation Rates

of Aggregate Groups

at Arizona State University

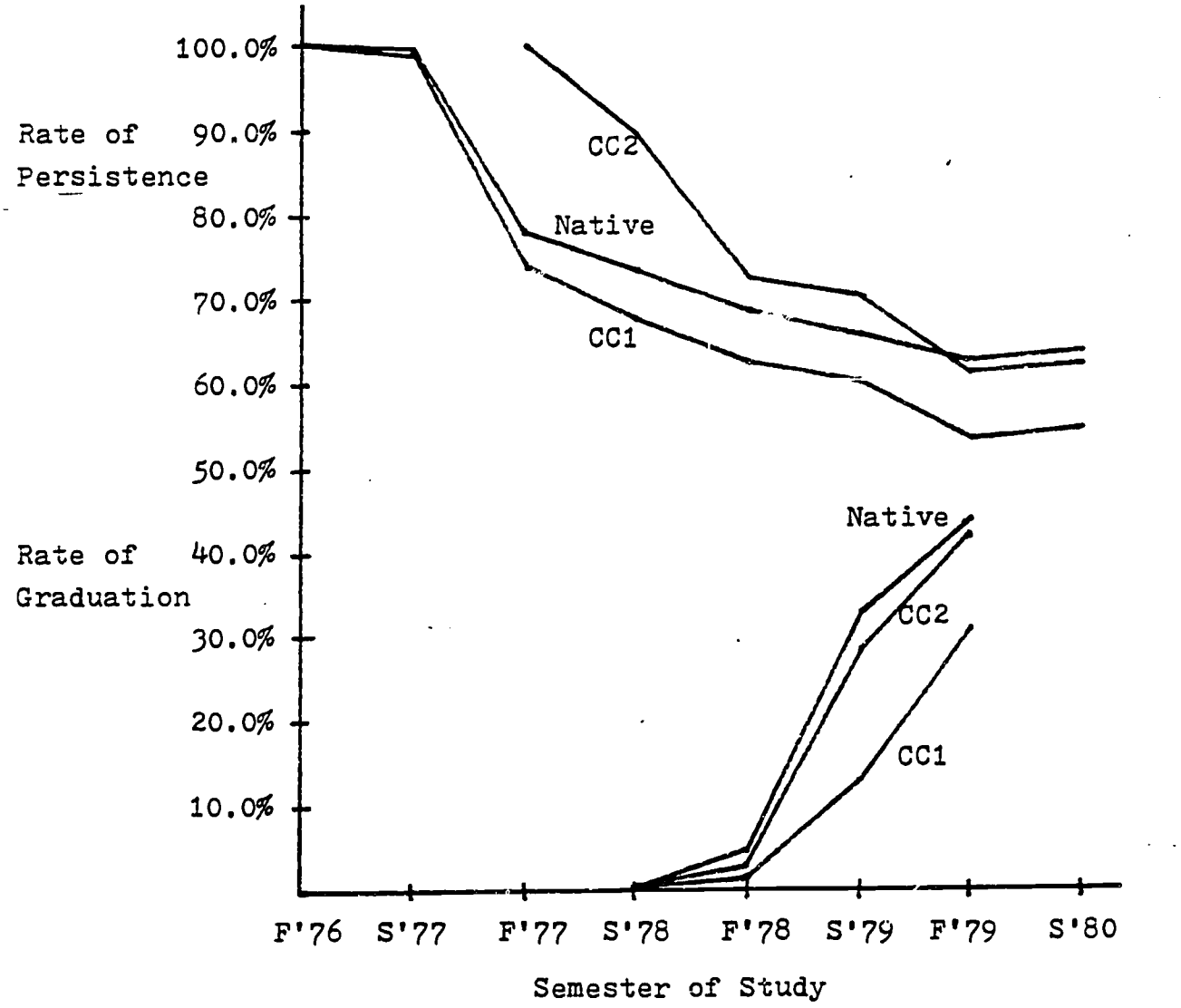



Performance and Progress
of Aggregate Groups
at Arizona State University
Cumulative Grade Point Average
3.5
3.0
2.5
2.0
Native
CC2
CC1
Cumulative Credit Hours Earned
70
60
50
40
30
20
10
Native
CC1
CC2
Entry
1st
2nd
3rd
4th
5th
Semester after Entry

Persistence and Graduation Rates

of Aggregate Groups

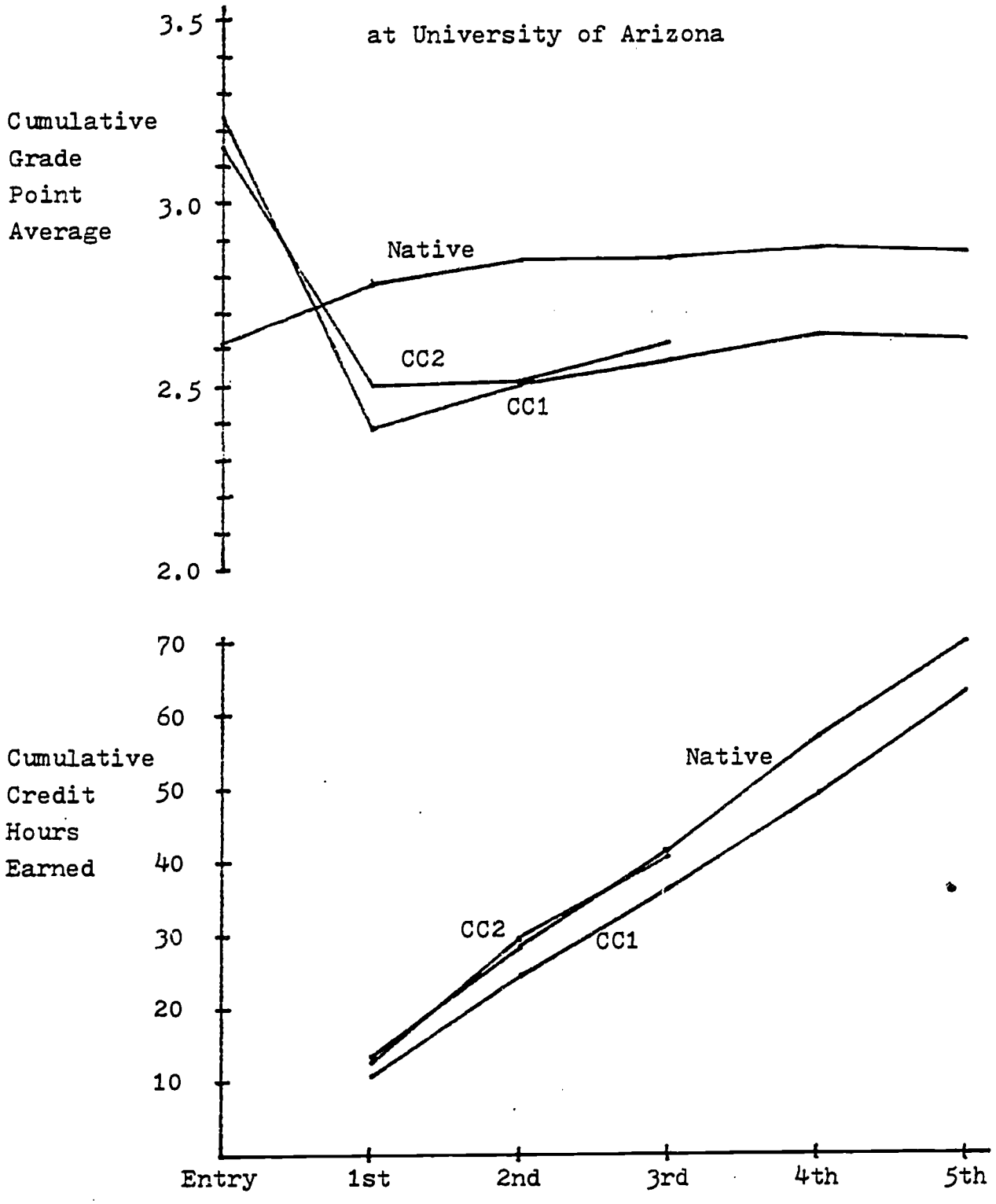
at University of Arizona



Performance and Progress

of Aggregate Groups

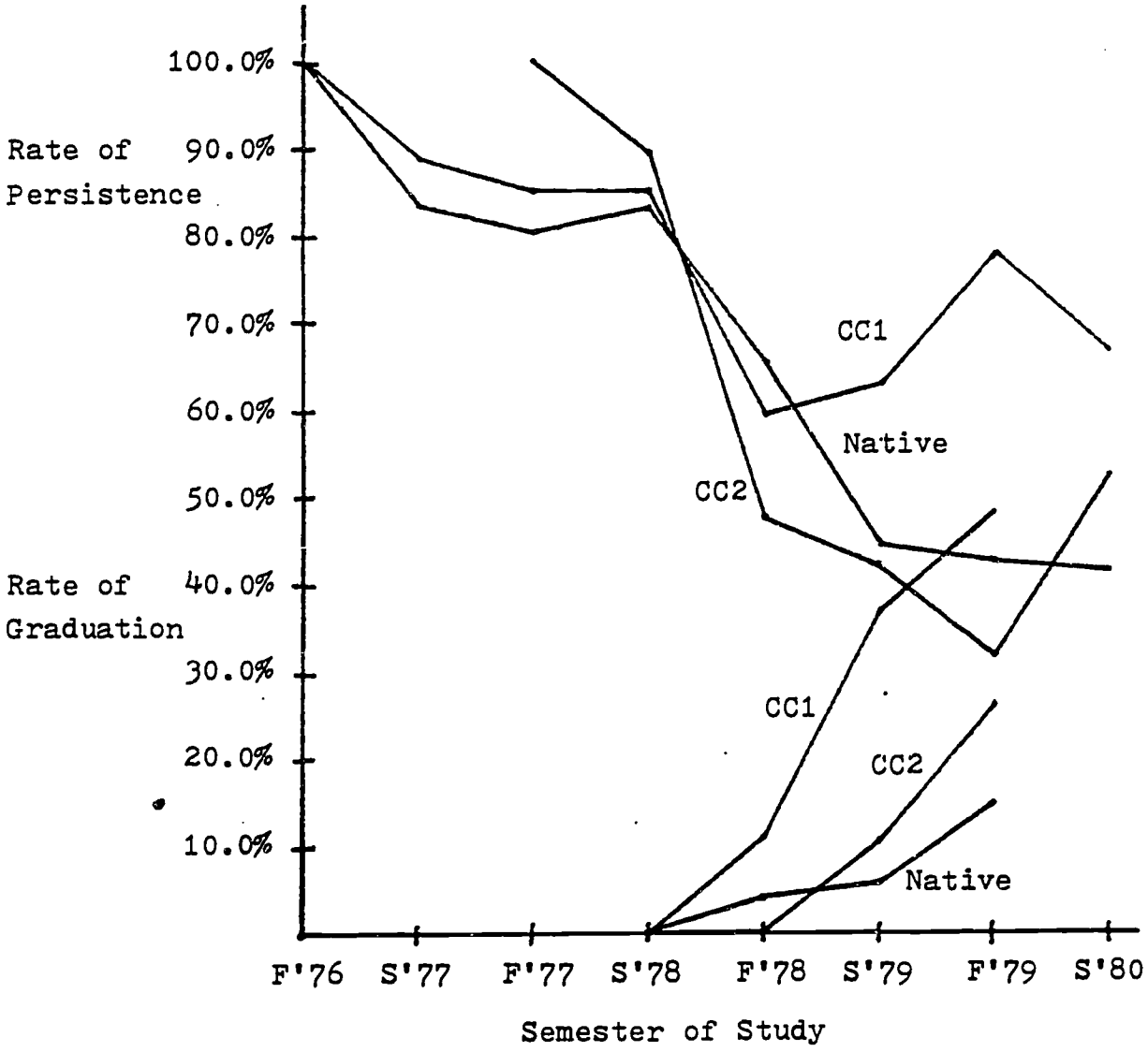
at University of Arizona



Persistence and Graduation Rates

of Aggregate Groups

at Northern Arizona University



Performance and Progress

of Aggregate Groups

at Northern Arizona University